UNIVERSITY
OF MICHIGAN
SEP 5 1951
MEDICAL
LIBRARY

The Journal of the International College of Surgeons

FOUNDED BY DR. MAX THOREK

SIXTEENTH NATIONAL ASSEMBLY

United States and Canadian Chapters
International College of Surgeons
Palmer House, Chicago
September 10-13 inclusive, 1951

Vol. XVI ***August, 1951*** **No. 2**

. . . when oral therapy is not feasible

. . . in severe, fulminating or necrotizing infections

. . . in pre- and postoperative prophylaxis

. . . in peritonitis

CRYSTALLINE

Terramycin

HYDROCHLORIDE

for hospital use only

INTRAVENOUS

CRYSTALLINE TERRAMYCIN HYDROCHLORIDE FOR INTRAVENOUS INJECTION

affords ***rapid*** control of infections caused by organisms in the bacterial, rickettsial and certain viral and protozoan groups

Supplied: 10 cc. vials containing 250 mg. of Crystalline Terramycin Hydrochloride with sodium glycinate as a buffer.

20 cc. vials containing 500 mg. of Crystalline Terramycin Hydrochloride with sodium glycinate as a buffer.

Antibiotic Division **Pfizer** CHAS. PFIZER & CO., INC., *Brooklyn 6, New York*

The Journal of the International College of Surgeons

FOUNDED IN GENEVA, SWITZERLAND, 1935 - INCORPORATED IN WASHINGTON, D. C., 1940

Editor-in-Chief

MAX THOREK, M.D., Sc.D., LL.D., F.B.C.S., F.I.C.S., D.C.M.

Assistant to the Editor

Dorothy Langley

Production Assistant

Susan Keller

Summary Editors

Dr. Manuel A. Manzanilla, Mexico D. F. — Spanish
Dr. Fritz Rothbart, Chicago — German
Dr. Jean Paul Le Gault, Montreal — French
Dr. Franco Amoruso, Montreal — Italian
Dr. Sabino Vieira de Freitas, Jr., Chicago — Portuguese

Publication Committee

Custis Lee Hall, M.D., *Chairman*
Max Thorek, M.D., *Editor-in-Chief*
Herbert Acuff, M.D.
Henry W. Meyerding, M.D.
Rudolph Nissen, M.D.
Francisco Graña, M.D.

CONTENTS—AUGUST, 1951

Primary Carcinoma of the Ureter 141
Herman M. Soloway, M.D., F.A.C.S., F.I.C.S., Chicago

Primary Carcinoma of the Ureter 160
J. Andrew Bowen, M.D., F.A.C.S., F.I.C.S., and Lytle Atherton, M.D., F.A.C.S., F.I.C.S., Louisville, Kentucky

Rhinoplastic Problems Confronting the Rhinologist 165
Matthew S. Ersner, M.D., F.A.C.S., F.I.C.S., Maurice H. Alexander, M.D., F.I.C.S., and David Myers, M.D., F.A.C.S., F.I.C.S., Philadelphia

Fractures of the Forearm 175
William Johnson, M.D., F.A.C.S., F.I.C.S., R. G. Hickerson, M.D., B. E. Malstrom, M.D., and E. G. Behrents, M.D., Galesburg, Illinois

The Journal of the International College of Surgeons

FOUNDED IN GENEVA, SWITZERLAND, 1935 - INCORPORATED IN WASHINGTON, D. C., 1940

Editor-in-Chief

MAX THOREK, M.D., Sc.D., LL.D., F.B.C.S., F.I.C.S., D.C.M.

Assistant to the Editor

Dorothy Langley

Production Assistant

Susan Keller

Summary Editors

Dr. Manuel A. Manzanilla, Mexico D. F. — Spanish
Dr. Fritz Rothbart, Chicago — German
Dr. Jean Paul Le Gault, Montreal — French
Dr. Franco Amoruso, Montreal — Italian
Dr. Sabino Vieira de Freitas, Jr., Chicago — Portuguese

Publication Committee

Custis Lee Hall, M.D., *Chairman*
Max Thorek, M.D., *Editor-in-Chief*
Herbert Acuff, M.D.
Henry W. Meyerding, M.D.
Rudolph Nissen, M.D.
Francisco Graña, M.D.

CONTENTS—AUGUST, 1951

Primary Carcinoma of the Ureter 141
Herman M. Soloway, M.D., F.A.C.S., F.I.C.S., Chicago

Primary Carcinoma of the Ureter 160
J. Andrew Bowen, M.D., F.A.C.S., F.I.C.S., and Lytle Atherton, M.D., F.A.C.S., F.I.C.S., Louisville, Kentucky

Rhinoplastic Problems Confronting the Rhinologist 165
Matthew S. Ersner, M.D., F.A.C.S., F.I.C.S., Maurice H. Alexander, M.D., F.I.C.S., and David Myers, M.D., F.A.C.S., F.I.C.S., Philadelphia

Fractures of the Forearm 175
William Johnson, M.D., F.A.C.S., F.I.C.S., R. G. Hickerson, M.D., B. E. Malstrom, M.D., and E. G. Behrents, M.D., Galesburg, Illinois

Stellate Ganglion Block in Treatment of Acute Subdeltoid Bursitis 185
Everett J. Gordon, M.D., F.A.C.S., F.I.C.S., Washington, D. C.

Surgical Treatment of Abdominal Ascites Due to Cirrhosis of the Liver: Preliminary Experience with New Cannula Button in Peritoneosaphenous Anastomosis 199
Charles F. Schnee, M.D., C.M., F.I.C.S., Patchogue, New York

Simplified Photography for the Surgeon 208
John T. Lloyd, M.D., Bluffton, Indiana

The Automatic Surgical Photographer 213
A. L. Soresi, M.D., F.I.C.S., New York

Roentgen Irradiation of the Adrenal Glands: Results of Indirect Hormonal Research 222
Manuel A. Manzanilla, Jr., Mexico D.F., Mexico

Drainage of the Infected Peritoneal Cavity 231
Anton P. Randazzo, M.D., C.M., F.I.C.S., and Emil Dul, M.D., Passaic, New Jersey

CASE REPORT
Diffuse Gastric Polyposis 240
Albin J. Sowka, M.D., and Edward H. Warszewski, M.D., F.A.C.S., F.I.C.S., Chicago

EDITORIALS
The Paris Orthopedic Clinics 245

CHAPTER NEWS 247

PROGRAM, SIXTEENTH ANNUAL ASSEMBLY, UNITED STATES CHAPTER, INTERNATIONAL COLLEGE OF SURGEONS 249

SCIENTIFIC MOTION PICTURE PROGRAM 258

SURGICAL FILM FORUM 261

IN MEMORIAM 262

HOME OF THE INTERNATIONAL COLLEGE OF SURGEONS AND THE UNITED STATES CHAPTER ... 263

FOUNDED BY DR. MAX THORE

The Journal of the International College of Surgeons

FOUNDED IN GENEVA, SWITZERLAND, 1935 - INCORPORATED IN WASHINGTON, D. C., 1940

Vol. XVI AUGUST, 1951 No. 2

Original Articles

Primary Carcinoma of the Ureter

HERMAN M. SOLOWAY, M.D., F.A.C.S., F.I.C.S.
CHICAGO

PRIMARY carcinoma of the ureter was originally described by Rayer[1] in 1841. Blix[2] reported the first authentic case with a microscopic diagnosis in 1878. Davy[3] in 1844 reported the first case of carcinoma of the ureter in the English language. Only 8 cases were reported prior to 1900, in all of which the diagnosis was made at autopsy. Albarran[4] is credited with recording, in 1902, the first instance of a correct preoperative diagnosis. During the following twenty years occasional cases of carcinoma of the ureter were reported by different writers. Judd and Struthers[5] reported the first case from the Mayo Clinic in 1912. Meeker and McCarthy[6] reported 33 cases, and two years later Kretschmer[7] reviewed the subject and found only 36 cases, including his own. Rousselot and Lamon[8] in 1930 found 49 cases in the literature and added 1 of their own. Four years later Scott[9] presented 2 cases and found 59 other acceptable cases in the literature. During the next decade excellent and thorough reviews of the literature on this subject were presented by Shillings,[10] Bergendahl,[11] Rusche and Bacon,[12] Foord and Ferrier,[13] Scott,[14] and Lazarus and Marks.[15] A total of 183 cases of primary carcinoma of the ureter appeared in the literature up to 1945.

It is an interesting fact that two-thirds of all the cases were reported during the previous decade. This can be attributed to the marked advance in diagnostic technic resulting from the continuous improvement of urologic instruments in the hands of an increasing number of men who are especially trained in urologic diagnosis. The trend toward more frequent and more complete autopsies has definitely increased the number of cases in the literature.

Since the last complete review of this subject by Lazarus and Marks in 1945, 70 cases have been reported in the literature by 29 different authors and their associates.[16] To these, the 7 cases presented below are added, bringing the total to 260 cases of primary carcinoma of the ureter available for study. The correct preoperative diagnosis in this latter group

Presidential Address, Chicago Urological Society, April 1951.
From the Urological Service, Cook County Hospital, and the Cook County Postgraduate School of Medicine.
Submitted for publication June 30, 1951.

was made in only 60 per cent of the cases. Although this is a higher percentage of correct preoperative diagnosis than that in the former group (39.3 per cent), there is still much room for improvement.

REPORT OF CASES

CASE 1.—A 59-year-old white steamfitter entered Cook County Hospital in March 1946, complaining of hematuria of one month's duration. He stated that he had always been in good health until he noticed "bloody urine", which was painless and present at all voidings. Physical examination revealed no abnormality, and the laboratory data, with the exception of macroscopic and microscopic red blood cells in the urine, were within normal limits. Cystoscopic examination revealed an efflux of bloody urine from the left ureteral orifice. Ureteral catheters were passed, the right to the renal pelvis and the left to a distance of 10 cm., at which point definite obstruction was met. Indigo carmine appeared from the right side in three and one-half minutes and from the left side in thirteen minutes. A bilateral pyelogram showed a normal right kidney, but on the left side the ureteral catheter buckled on itself at the point of obstruction. A second cystoscopic study revealed clear urine coming from both ureteral orifices. A No. 4 ureteral catheter was passed with difficulty beyond the point of obstruction. The left pyelogram was inconclusive, as the calyces were not sufficiently filled to permit a definite diagnosis. Intravenous pyelographic study was of very little value. Cystoscopy was again performed, and clear urine was seen coming from both ureteral orifices. A ureteral catheter again met definite obstruction about 10 cm. up the left ureter. The roentgenologist's report at this time was "ureteral calculus at the point of obstruction" (Fig. 1).

Fig. 1 (Case 1).—Pyelogram showing buckling of ureteral catheter at point of obstruction.

At operation, through a left rectus incision, a firm rounded mass was seen directly over the bifurcation of the iliac vessels, which was fixed to the surrounding structures. A frozen section revealed "metastases of a very anaplastic transitional cell carcinoma." The ureter was freed close to the bladder and removed. The wound was drained and closed, and a left nephrectomy was done at the same time. The pathologist reported "a normal left kidney" and "an infiltrating transitional cell carcinoma of the ureter, grade III." The patient made an uneventful recovery and left the hospital (Figs. 2 and 3).

Ten weeks later the patient was readmitted to the medical ward. He died three days later of bilateral pulmonary metastases (Fig. 4).

CASE 2.—A patient was transferred from the medical service of Cook County Hospital for diagnosis and treatment of a mass in the right upper quadrant of the abdomen. The past history revealed only gastrointestinal complaints (indigestion) and several episodes of gastric bleeding. The bleeding was due to a peptic ulcer which was adequately controlled before transfer.

Physical examination revealed a 65-year-old white man not acutely ill. The mass in the right upper quadrant was smooth, movable and not tender. Urine, blood counts, and blood chemical values were within normal limits except for occasional microscopic red and white cells. Cystoscopic examination gave negative results except for definite obstruction to a

ureteral catheter about 12 cm. up the right ureter. A second and a third attempt failed to pass the ureteral catheter up the right ureter to the renal pelvis. The left ureter and kidney were normal on an intravenous pyelogram. A right retrograde pyelogram and ureterogram showed the ureteral catheter at the inferior sacroiliac junction. After the injection of dye the bladder was visualized, but no dye was noted in the kidney pelvis or the ureter.

The preoperative diagnosis was ureteral occlusion due to a nonopaque calculus or stricture. Tumor of the ureter was considered, although no bloody drip was ever observed to come from a ureteral catheter. In fact, no drainage was ever obtained from the right ureter.

Operation consisted of a right nephrectomy. By the use of tension on the removed kidney, the ureter was isolated to the bladder. Immediately below the brim of the pelvis a fusiform swelling was noted, extending for about 2 cm. Below this point the ureter was of normal caliber. The ureter was clamped in the juxtavesical portion and divided below the clamp. The kidney and ureter were delivered from the wound, still distended with contained fluid and tumor. The wound was drained and closed in layers. The patient made an uneventful recovery and was discharged from the hospital.

Pathologic study of the specimen revealed, grossly, the hydronephrotic shell of a kidney with a hydroureter which was normal except for the lowest 4 cm., but at about this point the ureter was occluded by a polypoid greyish white mass. Microscopic section of the tumor revealed transitional cell proliferation, with metaplasia to the squamous epithelium (Figs. 5, 6 and 7).

CASE 3.—A 57-year-old white man entered St. Luke's Hospital (Dr. W. J. Baker's service) complaining of intermittent hematuria of seven months' duration. Laboratory data were normal except that urinanalysis showed many red blood cells and a 4 plus reaction for albumin. Cystoscopic study revealed a normal bladder. Both ureters were catheterized, and no obstruction was met. A hydronephrotic flow came from the left side; about 110 cc. of light urine was aspirated. Dye appeared from the left ureteral catheter in seven minutes and was of excellent concentration; in twelve minutes it appeared from the right catheter in poor concentration. The pyelogram revealed marked left hydronephrosis and hydroureter to the level of the sacrum. The preoperative

Fig. 2 (Case 1).—Gross specimen, showing ureteral tumor.

diagnosis was hydronephrosis of unknown cause. A nephroureterectomy was done, and the patient had an uneventful recovery and left the hospital three weeks after admission. The pathologic diagnosis was papillary carcinoma of the ureter.

One year later the patient was admitted to the Cook County Hospital, complaining of low back pain for the past three months. A flat plate revealed evidence of metastasis in the fourth lumbar vertebra and the right sacro-

Fig. 3 (Case 1).—High power microscopic section, showing infiltrating transitional cell carcinoma of ureter.

iliac joint. High voltage roentgen therapy was administered, with some relief of pain. The patient was removed from the hospital to a farm, where he died three months later (Figs. 8, 9 and 10).

CASE 4.—A 69-year-old Chinaman entered the Cook County Hospital complaining of pain in the back, loss of 40 pounds (18 Kg.) in weight during four months and difficulty in urination. Physical examination revealed him

to be markedly emaciated. The bladder was distended. Rectal examination showed an enlarged, firm, smooth prostate. The course was downhill, with an elevated temperature (102.6F). The patient became stuporous and died twelve days after admission. At autopsy a tumor was present in the middle third of the ureter which, microscopically, showed a transitional cell carcinoma (Fig. 11).

CASE 5.—An 85-year-old white woman was admitted to the Cook County Hospital in coma. The history revealed that she had been in fairly good health until two days before her admission, when she became extremely restless and uncontrollable. She died two and one-half hours later. Autopsy revealed marked left renal hydronephrosis and a tumor at the ureterovesical junction. Microscopic examination revealed a transitional cell carcinoma (Fig. 12).

CASE 6.—A white man, aged 55, entered the Cook County Hospital Dec. 16, 1940. He stated that he had had dyspnea for the past year, of gradually increasing severity. He had lost about 30 pounds (13.6 Kg.) during this time. He did not appear acutely ill. Laboratory data were within normal limits. There was a systolic murmur over the apex, and areas of dullness were present over both lung bases. The patient became progressively worse, and in spite of supportive measures died five days after admission. At autopsy a papillary carcinoma was observed in the middle third of the right ureter.

CASE 7.—A 74-year-old man entered the Cook County Hospital on Jan. 15, 1950, complaining of pain in the stomach and constipation of two weeks' duration. An episode of hematemesis had occurred two weeks before, and for two days he had had frequent vomiting spells, the vomitus including all ingested food and liquid. The abdominal pain was described as cramping and intermittent. A clinical diagnosis of carcinoma of the stomach was made. The laboratory data were within normal limits except for secondary anemia and elevated blood chemical levels. Treatment consisted of an oil and enema routine, Levine gastric suction and the administration of intravenous fluids. Roentgen examination revealed a small calcified density to the right of the third lumbar vertebra which was thought to be a ureteral stone. The hospital course was progressively downhill, and the patient died four days after admission. Autopsy revealed marked right hydronephrosis and an encircling tumor mass in the midportion of the right ureter. It was composed of greyish yellow tissue and extended into the periureteral tissues. Metastases to the right kidney, liver and lungs were observed. Microscopic examination revealed a transitional cell carcinoma of the midportion of the right ureter (Fig. 13).

CLINICAL, DIAGNOSTIC AND PATHOLOGIC FEATURES

Frequent reference will be made to the studies and compilations of the aforementioned writers in the following discussion.

Incidence.—Renner[17] (1931) found 3 cases of primary carcinoma of the ureter in 13,854 autopsies in five years at the Vienna Pathological Institute. Colston[18] (1933) found 2 cases in 22,000 urologic

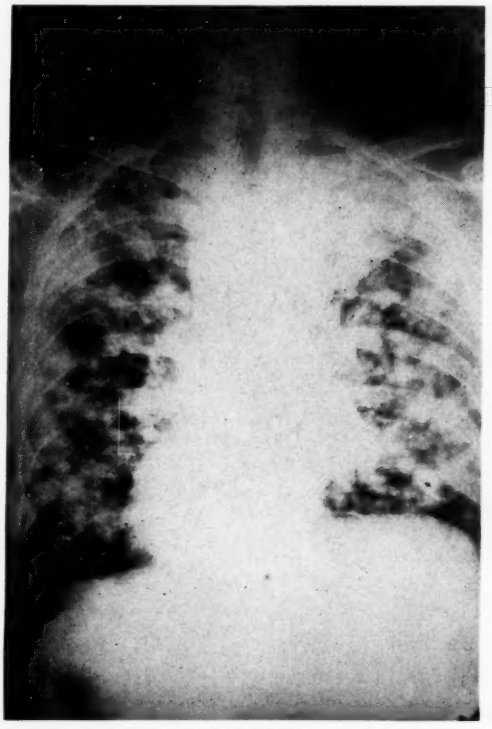


Fig. 4 (Case 1).—Pulmonary metastasis.

Fig. 5 (Case 2).—Gross specimen, showing marked hydronephrosis and ureteral tumor.

admissions at the Johns Hopkins Hospital. Jaffe and Mandillo[19] reported 2 cases in 90,000 routine admissions to the Grace Hospital, where 1,900 of these were for primary neoplasms in various locations. Gilbert[20] reported only 1 instance of a primary carcinoma of the ureter in 22,810 autopsies performed in Bellevue Hospital between 1904 and 1935. In 26,410 autopsies performed at Cook County Hospital

since 1930, 4 cases of primary carcinoma of the ureter were found.

Age of Patients.—The youngest patient reported on was a 22-year-old woman; the oldest, an 89-year-old man. The tumor occurs most frequently in the sixth and seventh decades of life.

Sex of Patients.—Male patients are affected twice as frequently as female.

Location of Growth.—The lower third of the ureter was the site of the tumor in over 50 per cent of the cases. The right ureter was involved more frequently than the left.

Symptoms.—Because of the concealed position of the tumor, the onset is usually insidious and the growth may be extensive and may have even metastasized before any symptoms develop. However, hematuria, pain and a palpable tumor mass constitute the characteristic triad of symptoms suggestive of this condition. Cases have been reported in which one or more of these symptoms was absent.

Hematuria is the outstanding symptom of primary carcinoma of the ureter and was present in over 70 per cent of the reported cases. It may be profuse or microscopic and may occur early or late in the course of the disease. It may be recurrent or constant. It usually is painless, although colic may occur as the result of the passage of blood clots down the ureter. Cases have been reported in which hematuria is absent. This type of bleeding differs in no way from bleeding originating in a renal tumor and can easily be confused with such bleeding.

Fig. 6 (Case 2).—Gross specimen, showing papillary ureteral tumor.

TABLE 1.—*Diagnosis*

	No. of Cases to 1945	No. of Cases since 1945	Total
Conditions diagnosed as ureteral tumors	72	42	114
Conditions diagnosed as probable ureteral tumors	14	1	15
Conditions diagnosed as tumor of genitourinary tract other than ureteral	12	7	19
Miscellaneous diagnoses	30	15	45
Cases in which no preoperative diagnoses were made	45	5	50

TABLE 2.—*Types of Tumors Reported*

Type of Growth	Number		Total
	To 1945	Since 1945	
Papillary carcinoma	88	43	131
Squamous cell carcinoma	23	9	32
Medullary carcinoma	8	..	8
Malignant papilloma	6	..	6
Carcinoma, grade 2	6	4	10
Carcinoma, grade 3	6	..	6
Carcinoma (type not mentioned)	5	5	10
Carcinoma, grade 4	5	2	7
Adenocarcinoma	4	2	6
Carcinoma simplex	4	..	4
Epithelioma	3	1	4
Solid carcinoma	3	..	3
Carcinoma, low malignancy	2	..	2
Mixed papillary and alveolar carcinoma	1	..	1
Mixed papillary carcinoma and carcinosarcoma	1	..	1
Mixed papillary carcinoma and adenocarcinoma	1	..	1
Transitional cell carcinoma	1	7	8
Basal cell carcinoma	1	..	1
Epidermoid carcinoma	1	..	1
Cylindrical cell carcinoma	1	..	1
Anaplastic carcinoma	1	1	2
Carcinoma, grade 1	1	3	4

Fig. 7 (Case 2).—High power microscopic section of ureteral tumor, showing transitional cell carcinoma.

Pain was present in about 60 per cent of cases. Pain may be due to ureteral obstruction from tumor or blood clot, or to involvement of nearby or remote organs by metastasis or extension. Pain due to obstruction is much more frequent and is characteristically a dull ache in the renal region. Pain resulting from extension to pelvic or abdominal organs is usually diffusely distributed, constant and frequently severe. Pain resulting from metastases to the hip, pelvic bones or lumbar vertebrae is constant and sometimes lancinating, similar to that which results from involvement of the same structures by metastases from carcinoma of the prostate.

Tumor was palpable in about 40 per cent of the cases reported. In the majority of cases the mass felt was an enlarged

hydronephrotic kidney, the hydronephrosis being secondary to obstruction by tumor. Cases have been mentioned in which the ureteral tumor was palpated abdominally, vaginally or rectally. Symptoms less frequently observed were frequency of urination, dysuria, loss of weight, loss of appetite, nausea, vomiting and, in some cases of infection, chills and fever. One or more of the aforementioned symptoms had been present from one to two years in nearly 45 per cent of the reported cases.

The *diagnosis* of primary carcinoma of the ureter in an early stage of development is very difficult. A survey of the literature reveals that a correct preoperative diagnosis of primary carcinoma of the ureter was made in 39.3 per cent of the cases. Diagnosis of a "probably ureteral" tumor was made in 7.7 per cent. The diagnosis was not even suspected in over 50 per cent of the cases reported (Table 1). It is interesting to note that up to 1915 most of the diagnoses were made at autopsy.

The diagnosis can be correctly made by one alert to this entity on the basis of history, symptoms, physical examination and especially cystoscopic study, with supplementary urologic studies such as are here listed:

1. *Examination of the urine* may reveal gross or microscopic red blood cells, or small fragments of tumor tissue may be found.
2. A *plain roentgenogram* may show metastases in the bones or chest, hydronephrosis or stone in the affected side.
3. *Cystoscopic examination* may reveal efflux of bloody urine from a ureteral orifice (30 per cent), or projection of tumor from the ureteral meatus (25 per cent).
4. The ureteral catheter may give valuable information. An obstruction was encountered at the site of the tumor in 55 per cent of the reported cases. In a few cases (e.g., case) the catheter passed to the renal pel-

TABLE 3.—*Operations Most Often Reported*

	Up to 1945	Since 1945	Total
Nephrectomy and partial ureterectomy, removal of tumor	24	9	33
Nephroureterectomy	23	29	52
Nephroureterocystectomy	10	..	10
Exploratory	10	..	10
Nephrectomy ureterectomy later	9	18	27
Nephrectomy and partial ureterectomy—later ureterocystectomy	8	..	8
Ureteronephrectomy	7	..	7
Nephrectomy and partial ureterectomy—later removed of rest of ureter and tumor	6	1	7
Partial ureterectomy—later removal of rest of ureter and nephrectomy	4	2	6
Resection of lower end of ureter with transplantation to bladder	4	4	8
Partial resection of bladder and ureteronephrectomy	3	5	8
Resection of lower end ureter with transplantation to skin	3	..	3
Resection of tumor bearing area with end-to-end anastamoses	1	2	3
Patients treated by other types of operations	38	5	43

vis readily, causing no bleeding. In some cases, especially if the tumor is located at the lower end of the ureter, slight trauma caused by the mere passing of a ureteral catheter may result in a continuous flow of blood through or around the catheter. Again, a catheter through which blood may be coming may drain off clear urine on passing beyond the tumor.

5. *Urographic studies* are of great value. However, the intravenous urogram is of little or no value in most cases, because of the tendency toward a marked decrease in function in the involved side and the need of a sharp surface delineation for diagnostic purposes. It will usually show no dye or a faintly outlined, hydronephrotic kidney on the affected side. Retrograde procedures include air pyelourograms, stereoscopic urograms of the kidney and ureter, serial pyelograms, the injection of a catheter while drawing it down from the pelvis at different levels, with a picture of each; and, in the presence of an impassable ureteral obstruction, the injection of contrast medium through a tight-fitting Garceau catheter.

Fig. 8 (Case 3).—Pyelogram showing marked hydroureter and hydronephrosis with definite occlusion at lower end of ureter.

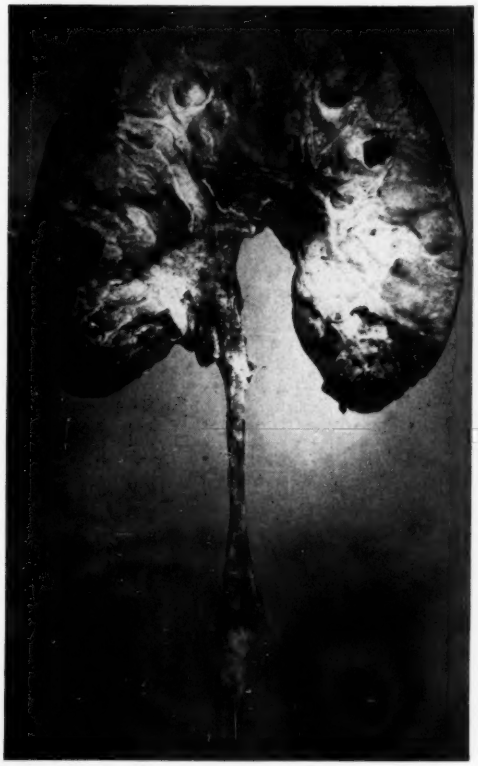


Fig. 9 (Case 3).—Gross specimen, showing hydronephrosis and site of ureteral tumor.

A definite diagnosis of primary ureteral tumor can be made only on a characteristic and constant filling defect in the ureterogram, together with a pyelogram excluding renal neoplasm. The character of the filling defect will depend upon the type, shape and extent of the growth. A nonpapillary infiltrating tumor usually causes an irregular decrease in the size of the lumen of the ureter, often accompanied by dilatation of the kidney and ureter above

the site of the tumor. The tumor, if solid or pedunculated, may cause a goblet-shaped filling defect with dilatation of the ureter above and below the tumor mass. Multiple papillary tumors will show modifications of this picture and may be seen throughout its entire length. If the surface of the tumor is irregular, the filling defect may present a ragged, motheaten appearance. Hematuria from a ureter which has had its kidney removed is diagnostic of a ureteral neoplasm. Counsellor has stated, "Unexplained hydronephrosis among patients of more than 50 years or hematuria should warrant investigation of the ureters, if no other pathologic change is found."

Positive diagnostic signs present in the reported cases in order of frequency are obstruction to the ureteral catheter, enlarged (hydronephrotic) kidney, blood coming through the ureteral catheter, tumor presenting at the ureteral orifice, a filling defect in the ureterogram and a mass palpable along the course of the ureter.

Pathologic Picture.—Primary tumors of the ureter fall into two main groups, those arising from the structures comprising the ureteral wall and those arising from the mucosa of the ureter. The former type is very rare and includes myoma, hemangioma, fibrolipoma, neurofibroma and sarcoma. These tumors may be either benign or malignant. The latter group constitute by far the vast majority of ureteral tumors. This group of neoplasms have been mentioned under at least twenty different pathologic terms, thus causing much unnecessary confusion. They may be considered to fall into two main groups, papillary and nonpapillary (Table 2).

Papillary carcinoma is most frequent and may appear (a) as a single pedunculated solid carcinoma which distends and blocks the lumen; (b) as a single papillary carcinoma with a sessile invaded base, or (c) as a diffuse papillary carcinoma showing multiple growths and often extending nearly the entire length of the mucosa of the ureter.

The solid or nonpapillary carcinoma usually begins as a localized lesion and may continue as localized diffuse thickening of the wall until the entire circumference is involved. Although the pathologic character of ureteral tumors is quite similar to that of bladder tumors, they tend to spread early, extensively and quickly. This may not be due to a greater malignant activity but rather to the anatomic characteristics of the ureteral wall, in which the musculature is thin and the vascular and lymphatic supply abundant. Keen and Bernstein[22] reported a case in which metastases occurred six weeks after the onset of the first symptoms.

Metastases were observed in 62 per cent of the reported cases. The organs involved, in order of frequency, were regional and distant lymph nodes, liver, lungs, bones, kidney, adrenals, spleen, brain, pancreas and skin.

Prognosis.—The prognosis of carcinoma of the ureter is poor. In the 149 operative cases reported, 33 patients, or 24 per cent, died postoperatively of shock, pneumonia, ileus or myocardial failure; 26 died in the first year after operation; 9 died between the first and the second year, and 6 died between three and four years later. Of the patients recorded as having died four or more years after operation, none died of metastases or local recurrence. Of 32 patients who were followed and reported well, only 6 had been observed four years or more. One patient lived five years and one patient was followed and well eleven years after operation. Crance and Knickerbocker[23] recently reported the case of a patient living and symptom-free twenty-five years after the operation.

Treatment.—A review of the literature reveals that more than thirty different operations have been performed for primary carcinoma of the ureter. The difficulty in making a correct preoperative diagnosis in 40 to 60 per cent of the cases undoubtedly accounts for this great variety of surgical procedures (Table 3). In many cases operation has been performed for hydronephrosis and then, after removal of the

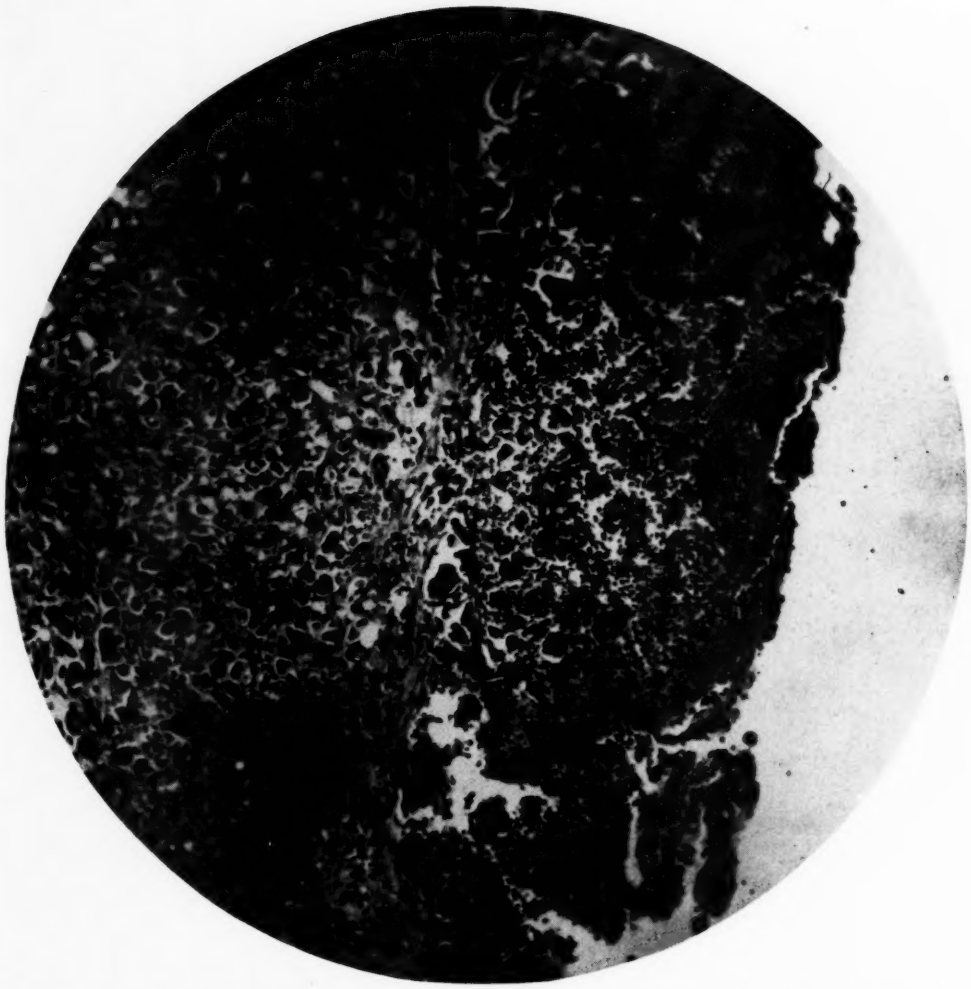


Fig. 10 (Case 3).—High power microscopic section showing squamous cell carcinoma of ureter.

kidney, a second operation had to be performed to remove the tumor-bearing segment of the ureter (Von Cappelen,[24] Judd and Struthers, Suter[25] and others).

The treatment of choice is radical removal of the kidney and ureter, segmental resection of the bladder and as much of the periureteral tissues and lymphatics as possible, depending upon the patient's condition and the operative difficulties encountered. If it is necessary to complete the operation in two stages, the tumor should be removed at the first operation.

Thompson-Walker[26] and Thomas[27] have resected small tumors of the lower part of the ureter and reimplanted the proximal end of the ureter back into the bladder. Papin[28] resected a tumor of the upper part of the ureter and transplanted the ureter into the pelvis. Recently McClelland[29] reported a case in which the involved portion of the ureter was excised and the cut ends

Fig. 11 (Case 4).—High power microscopic section showing transitional cell carcinoma of right ureter.

anastomosed. These procedures are very conservative and may prove effective for small lesions. The experience of most urologists shows that the probability of early recurrence overbalances the value of attempting to save the kidney above the tumor. Each patient's treatment must be individualized and the procedure followed

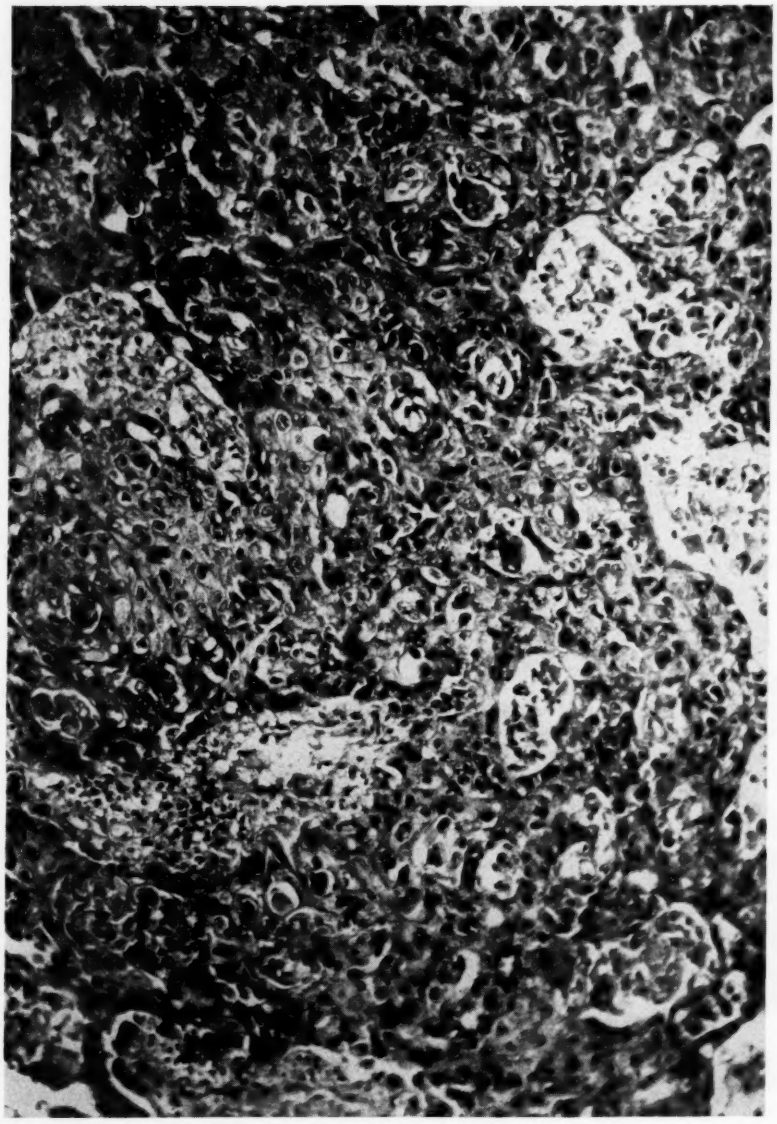


Fig. 12 (Case 5).—High power microscopic section showing transitional cell carcinoma of left ureter.

which is in keeping with the operative observations and the general condition of the patient.

High voltage roentgen and radium therapy have been used with questionable results. Postoperative roentgen treatment, however, is of some value in relieving pain resulting from extension and metastases.

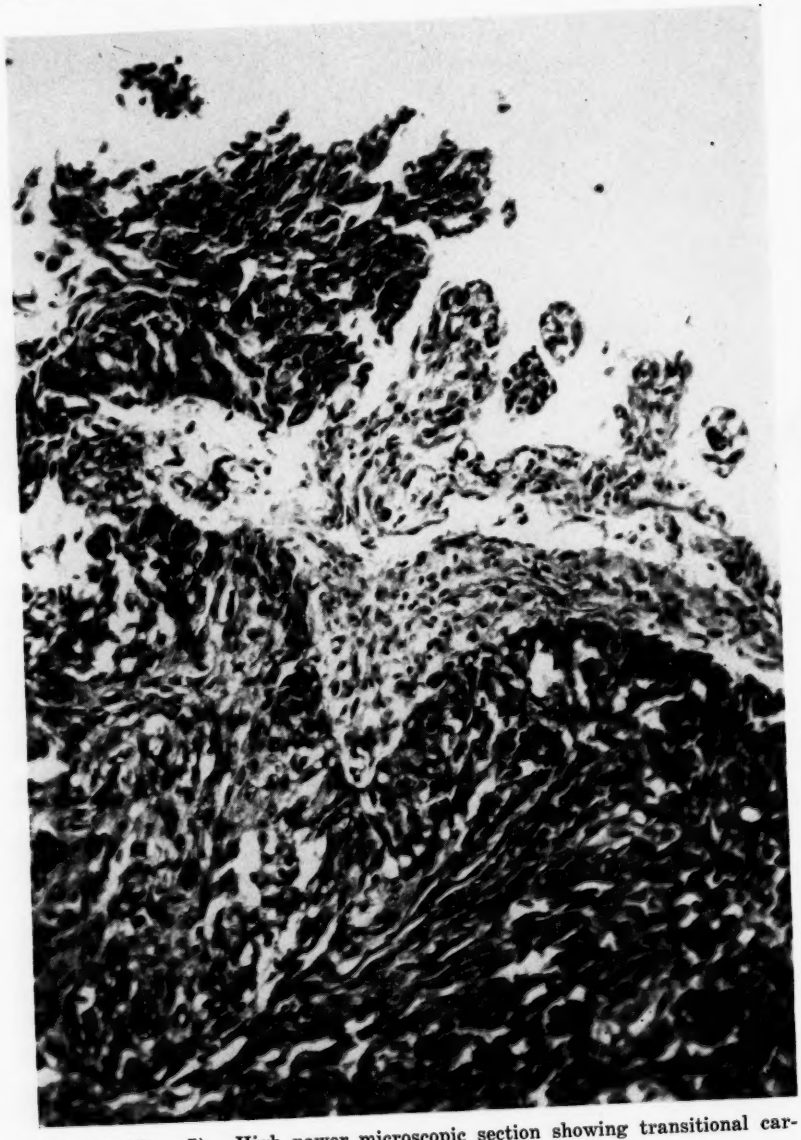


Fig. 13 (Case 7).—High power microscopic section showing transitional carcinoma of right ureter.

SUMMARY AND CONCLUSIONS

The literature on primary carcinoma of the ureter is reviewed, summarized and brought up to date.

Primary carcinoma of the ureter is a comparatively rare condition and is being reported in an increasing rate, owing to new appreciation of this entity's importance and to improved diagnostic technic.

Yet it defies a correct preoperative diagnosis in nearly 40 per cent of cases. It occurs more frequently in the lower third of the ureter and in male patients in the sixth and seventh decades of life.

The diagnosis is based on hematuria from one ureter, together with obstruction or a filling defect as shown by a urogram, or observation of a tumor protruding from a ureteral orifice.

The many confusing pathologic descriptions used in describing these lesions indicate the need of a simple classification. They resemble vesical tumors in their pathologic characteristics except that they spread earlier, more extensively and more quickly.

The greatest hope for cure depends on early diagnosis, so that radical surgical procedures may be carried out.

RÉSUMÉ ET CONCLUSIONS

On passe en revue de la littérature sur le cancer primaire de l'uretère et un résumé est mené à date.

Le cancer primaire de l'uretère est relativement rare et on en rapporte plus souvent étant donné la plus grande importance qu'on attache à son entite et aux améliorations qu'on apporte en matière de diagnostic. Malgré tout, dans 40% des cas, un bon diagnostic pré-opératoire n'est pas posé. Il est plus fréquent au tiers inférieur de l'uretère chez les patients entre 60 et 70 ans.

On base le diagnostic sur l'hématurie venant d'un uretére et la présence d'obstruction ou d'image par addition sur l'urographie ou l'observation de tissu tumoral faisant hernie d'un orifice urétéral à la cystoscopie.

Le nombre confus de signes pathologiques découvrant ces lésions nous indique le besoin d'une classification plus simple. Elles simulent une tumeur vésicale dans leur caractéristique pathologique sauf q'elles s'étendent plus tôt avec plus d'extension et plus rapidement.

Un plus grand espoir de guérison repose sur un diagnostic précoce de telle sorte que l'on puisse pratiquer une cure chirurgicale radicale.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Der Verfesser gibt einen Ueberblick und eine Zusammenfassung der bis zum heutigen Tage vorliegenden Literatur ueber das primaere Harnleiterkarzinom.

Der primaere Harnleiterkrebs ist eine verhaeltnismaessig seltene Erkrankung, die allerdings mit zunehmender Haeufigkeit beobachtet wird, weil ihre Bedeutung neue Wuerdigung gefunden hat, und weil bessere Mittel der Diagnostik vorhanden sind. Trotzdem entzieht sich die Erkrankung in etwa 40% der Faelle der prae-operativen Diagnose. Das Leiden tritt meistens im unteren Drittel des Harnleiters auf und befaellt vorwiegend Maenner im sechsten und siebenten Lebensjahrzehnt.

Die Diagnose stuetzt sich auf einseitige Harnleiterblutung in Verbindung mit roentgenologisch nachgewiesener Verstopfung oder Fuellungsdefekt des Harnleiters, oder auf die Beobachtung einer aus der Harnblasenmuendung herausragenden Geschwulst.

Die vielen verwirrenden Darstellungen, die zur Beschreibung der Pathologie dieser Geschwuelste angewandt werden, beweisen die Notwendigkeit einer einfachen Klassifikation. Die pathologischen Eigenheiten der Geschwuelste aehneln denen der Blasentumoren mit der Ausnahme, dass sie sich fruehzeitiger, rascher und umfangreicher ausbreiten.

Die Heilungsaussichten haengen wesentlich von einer fruehen Diagnose und der Moeglichkeit eines rechtzeitigen radikalen chirurgischen Eingriffs ab.

RESUMEN Y CONCLUSIONES

Se revisa la literatura sobre el carcinoma primario ureteral, resumiéndola y poniéndola al día.

El carcinoma primario ureteral es comparativamente raro, comunicándose un aumento de su incidencia en relación con nueva apreciación de su importancia y

mejor técnica para el diagnóstico. En el 40% aproximadamente de los casos aun no es posible un diagnóstico preoperatorio correcto. Se presenta frecuentemente en el tercio inferior ureteral y en pacientes masculinos en la sexta y séptima décadas de la vida.

El diagnóstico se basa en la hematuria uniureteral, junto con obstrucción o un defecto de llenado mostrado röntgenográficamente o la observación de tumor procidente de un orificio ureteral.

Las muchas descripciones patológicas confusas usadas para describir estas lesiones indican la necesidad de una clasificación sencilla. Son comparables a los tumores vesicales en sus características patológicas, excepto en que estos se difunden más temprano, más extensamente y más rápidamente.

La esperanza máxima de curación depende del diagnóstico temprano, de modo que puedan emplearse los procedimientos quirúrgicos radicales.

RIASSUNTO E CONCLUSIONI

E' rivista riassunta e aggiornata la letteratura sul carcinoma primitivo dell'uretere. Il carcinoma primitivo dell'uretere é una relativamente rara lesione che viene oggi riferita in un certo aumento, probabilmente dovuto a migliorata tecnica diagnostica e migliore comprensione dell'entita' morbosa. Tuttavia sfugge alla corretta diagnosi preoperatoria in circa il 40% dei casi.

Si verifica piu' frequentemente nel terzo distale dell'uretere e in maschi nella sesta settima decade di vita. La diagnosi é basata sul reperto di ematuria ureterale, insieme con un'ostruzione o un difetto di riempimento nell'urogramma, o il reperto di un tumore protrudente dall'orificio ureterale.

Le confuse descrizioni patologiche di questa entita' indicano il bisogno di una classificazione semplice. Essi rassomigliano i tumori vescicali nelle loro caratteristiche patologiche eccetto il fatto che essi disseminano piu' precocemente, piu' estensivamente e piu' rapidamente. Le migliori speranze di guarigione risiedono nella diagnosi precoce cosicche il trattamento chirurgico radicale possa essere condotto.

SUMÁRIO E CONCLUSÕES

A literatura sobre o carcinoma primário do uréter é revista, resumida e atualizada.

O carcinoma primário do uréter é comparativamente raro, mas está sendo descobérto em indice crescente, devido a melhor apreciação de sua importancia e ao aperfeiçoamento da técnica de diagnóstico. Em 40 por cento dos casos, contudo, falta um corréto diagnóstico pré-operatório. O sitio de maior frequencia é o têrço inferior do uréter, em pacientes do sexo masculino, na sexta e setima décadas da vida.

O diagnóstico é feito sobre a base de hematúria em um uréter, juntamente com obstrução ou defeito de enchimento demonstrado em urograma, ou observação de um tumôr exuberante de um orificio ureteral.

A maioria dos relatórios usados em patologia para descrever estas lesões é confúsa e indica a necessidade de uma classificação simples. Elas paracem tumôres vesicais em suas caracteristicas patológicas, excépto porque elas se disseminam precócemente, mais extensamente e mais rapidamente.

A grande esperança na cura depende do diagnostico precóce de fórma que processos cirurgicos radicais possam ser empregados.

REFERENCES

1. Rayer, P.: Traite' des Maladies des Reins. Paria 3:699, 1841.
2. Wising, P. J., and Blix, C.: Hygeia 40:468, 1878.
3. Davy, R.: Brit. M. J. 2:757, 1884.
4. Albarran, J., Bull. et Mem. de la Soc. de Chirurg. de Paris 27:838, 1902.
5. Judd, E. S., and Struthers, J. E.: J. Urol. 6:115, 1921.
6. Meeker, L. H., and McCarthy, J. F.: J.A.M.A. 86:102, 1923.
7. Kretschmer, H. W.: Trans. Am. Assoc. Genitourin. Surg. 16:73, 1923.

8. Rousselot, L. M., and Lamon, J. D.: Surg., Gynec. & Obst. 50:17-28, 1930.
9. Scott, W. W.: Surg., Gynec. & Obst. 58:215, 1934.
10. Shillings, M., and Sendervorst, F. A.: Rev. belge sc. Mid. 8:225, 1936.
11. Bergendal, Seved: Acta chir. Scandinav. 74:179, 1934.
12. Rusche, C., and Bacon, S. K.: J. Urol. 39:319, 1938.
13. Foord, A. G., and Ferrier, P. A.: J.A.M.A. 112:596, 1939.
14. Scott, W. W.: J. Urol. 50:45, 1943.
15. Lazarus, J. A., and Marks, M. S.: J. Urol. 54:140, 1945.
16. (*a*) Counseller, V. S.; Cook, E. N., and Seefeld, P. H.: J. Ulrol. 51:606, 1944. (*b*) Barnes, R. W., and Kawaichi, G. K.: Urol. & Cutan. Rev. 48:430, 1944. (*c*) Bowie, C. F., and Bors, E.: J. Urol, 54:434, 1945. (*d*) Barney, J. D.: New Eng. J. Med. 235:337, 1946. (*e*) De la Pena, A., and De la Pena, E.: Urol. & Cutan. Rev. 50:667, 1946. (*f*) La Porte, F., and Muret, J.: J. d'urol. 53:278, 1946. (*g*) Hundley, J. M., and Hunter, J. S.: J. Urol. 58:176, 1947. (*h*) Grossman, S. L., and Allyn, R. E.: Pennsylvania M. J. 50:715, 1947. (*i*) Gualtieri, T.; Hayes, J., and Segal, A.: J. Urol. 59:1083, 1948. (*j*) Hale, N. G.: Urol. & Cutan. Rev. 52:3, 1948. (*k*) Burford, C. E.; Glenn, J. E., and Burford, E. H.: J. Urol. 60:337, 1948. (*l*) Stock, F. E., and Wells, C.: Brit. J. Urol. 20:19, 1948. (*m*) Ponce, J. A., and Ponce, M. C.: Arch. Espan. Urol. 4:191, 1948. (*n*) Kojen, L., and Petkovic, S.: Urol. & Cutan. Rev. 53:275, 1949. (*o*) Goldberg, Leo. G.: Urol. & Cutan. Rev. 54:288, 1949. (*p*) Long, J. H.: J. Urol. 61:23, 1949. (*q*) Brooks, W. H.: J. Urol. 61:29, 1949. (*r*) Vest, S. A.: J. Urol. 53:97, 1945. (*s*) McLeery, G.: Urol. & Cutan. Rev. 53:595, 1949. (*t*) Harrison, F. G.; Warres, H., and Fust, J.: Ann. Surg. 130:902, 1949. (*u*) Carrodus, A. L., and Howarth, V. S.: Brit. J. Surg. 37:238, 1949. (*v*) Fagerstrom, D. P.: J. Urol. 59:333, 1948. (*w*) Smith, B. A.: Journal-Lancet 69:233, 1949. (*x*) Mortenson, H., and Murphy, L.: Brit. J. Urol. 22: 103, 1950. (*y*) Tuffill, S. G.: Brit. J. Urol. 22: 138, 1950.
17. O'Conor, V. J., and Price, W. E.: Chicago Urol. Soc., Dec. 1950.
18. Renner, M. J.: Surg., Gynec. & Obst. 52:793, 1931.
19. Colston, J. C.: J. Am. Assoc. Genitourin. Surg. 26:35, 1933.
20. Jaffe, S. A., and Mandillo, A. J.: Am. J. Surg. 62:126, 1943.
21. Gilbert J. B.: Am. J. Surg. 36:711, 1937.
22. Keen, M. B., and Bernstein, J. C.: Am. J. Surg. 51:402, 1941.
23. Crance, A. M., and Knickerbocker, H. J.: J. Urol. 64:300, 1950.
24. Von Cappelen, H.: Beitr. z. klin. Chir. 99:138, 1916.
25. Suter, F.: Ztschr. Urol. Chir. 99:138, 1916.
26. Thompson-Walker, J.: Proc. Roy. Soc. Med. 14:25, 1921.
27. Thomas, B. A., in discussion on McGown, P. E.: J.A.M.A. 94:468, 1930.
28. Papin, M.: Bull. Soc. franc. d'urol., June 1935.
29. McClelland, J. C.: J. Urol. 52:522, 1944.

For information pertaining to qualifications for

Certified Fellowship, Associate Membership or Junior Membership in the

United States Chapter, International College of Surgeons

please communicate with

Dr. Arnold S. Jackson, *Secretary*

1516 Lake Shore Drive

Chicago 10, Illinois

Primary Carcinoma of the Ureter

J. ANDREW BOWEN, M.D., F.A.C.S., F.I.C.S. AND
LYTLE ATHERTON, M.D., F.A.C.S., F.I.C.S.
LOUISVILLE, KENTUCKY

PRIMARY carcinoma of the ureter is still a rather unusual entity. First described in 1841 by Rayer[1] in an autopsy report, it was not until 1878 that Wising and Blix[2] published a full microscopic description of this disease. By 1900, 8 cases had been reported, all from autopsy reports. In 1930[3] only 14 of 50 patients reported on had had a correct preoperative diagnosis. From this time on, preoperative diagnosis became more frequent. In 1937 Foard and Ferrier[4] recorded 139 such cases, in 1943 Scott[5] obtained 182, and in 1947 Pilcher[6] was able to report 200. Gilbert[7] found only 1 case in 22,810 autopsies from Belleview Hospital between 1904 and 1935; Colston[8] reported 2 instances in 22,000 urologic cases, and Renner[9] observed 3 cases in 13,854 autopsies studied at the Vienna Pathologic Institute.

The symptoms usually include hematuria with or without pain, tenderness over the kidney on the involved side if obstruction has occurred and in some cases the presence of a mass. The growth may have extended into the bladder and be found protruding from the involved ureter, or it may appear as a discrete papilloma in an area of the bladder removed from the orifice. The microscopic picture of these tumors may be likened to that of papilloma of the bladder, which has many of the same characteristics. The similarities are these: both are capable of being transplanted at lower levels in the ureter and in the bladder, and postoperative recurrences of both occur primarily in the bladder. Their pathologic grading is on the same basis, and recurrence shows a definitely increased tendency toward malignant change. The prognosis is based on the grading of the original microscopic picture, and it has been found that the prognosis for the lower grades is good when proper surgical measures are utilized. The higher grades suggest a life expectancy of two to three years. The consensus as to management is in favor of the removal of the kidney and ureter, together with a cuff of the bladder surrounding the orifice on the involved side. Extension usually occurs in the bladder by generalized metastasis.

The present cases have no unusual characteristics and are reported only as a matter of record.

Submitted for publication April 27, 1951.

REPORT OF CASES

CASE 1 (J.A.B.).—H. M., a white man aged 54, was seen first on May 7, 1950. He complained of hematuria of approximately two years' duration. From the date of onset of the disease until six weeks before the patient was seen, the bleeding had been painless and intermittent, lasting only twenty-four to forty-eight hours, and the blood had been passed readily and without clots. During the previous six weeks it had been almost constant, passed with clots and discomfort, and accompanied by aching pain over the right kidney area.

Cystoscopic and pyelographic examinations in May 1948 gave negative results. Both the family history and the past history were noncontributory. Physical examination revealed little except slight rebound tenderness over the right kidney. The patient showed no loss in weight or in strength. The temperature was 98.6 F., the pulse rate 80 and the respiratory rate 21. The blood pressure in millimeters of mercury was 154 systolic and 90 diastolic. The voided urine was grossly clear, with a specific gravity of 1.022. There was a faint trace of albumin; a few erythrocytes and leukocytes were seen on the microscopic slide. The erythrocyte count per cubic millimeter of blood was 4,870,000; the leukocyte count, 7,300, with 3 per cent eosinophils, 4 per cent stab cells, 55 per cent segmental cells, 59 per cent neutrophils, 33 per cent

lymphocytes and 5 per cent monocytes. The nonprotein nitrogen level was 32 mg. per hundred cubic centimeters. The Mazzini test gave negative results. Cystoscopic examination showed a slight enlargement of the prostate, a bladder mucosa clear of papilloma and normal orifices. A No. 6 catheter passed readily on either side. Urine specimens from each side were clear. Intravenous indigo carmine appeared promptly (two minutes) on the left in excellent concentration. No dye was excreted on the right during the examination. On microscopic examination of the divided specimens, both sides revealed 8 to 10 red blood cells per high power field. The roentgenologist reported moderate hydronephrosis and hydroureter of the abdominal portion on the right side. The right ureter contained serpiginous filling defects, which appeared to be attached to the ureteral wall at several points (Fig. 1).

After the diagnosis of carcinoma of the ureter had been made, the right kidney and ureter were removed. This was done through a modified Gibson incision on the right, exposing the ureter extraperitoneally in the true pelvis and following it down to the bladder, severing it flush with the bladder proper. The proximal end was ligated, covered with gauze and pushed upward. Closure of this wound was accomplished, with drainage. The kidney was exposed through a transverse incision and readily removed, with the complete ureter. The postoperative course was uneventful, and the patient was discharged from the hospital on the ninth postoperative day.

Fig. 1 (Case 1).—Filling defect in lower third of right ureter, with mottling shadows above denoting blood clot debris.

Fig. 2 (Case 1).—Cut section of gross specimen, showing solid tumor filling lower third of ureter with clot and debris above.

Pathologic examination of the gross specimen showed moderate hydronephrosis and hydroureter and a pedunculated polyp just below the midportion of the ureter, measuring 2 cm. in length by 1.5 cm. at the greatest diameter. The stalk appeared intact, the body of the polyphemorrhagic and edematous (Fig. 2). Apparently there was complete occlusion of the ureter, with much hemorrhagic fragmented débris above and below the polyp. Microscopic examination revealed the ureter to be lined with flat transitional epithelium which extended over the stalk and part of

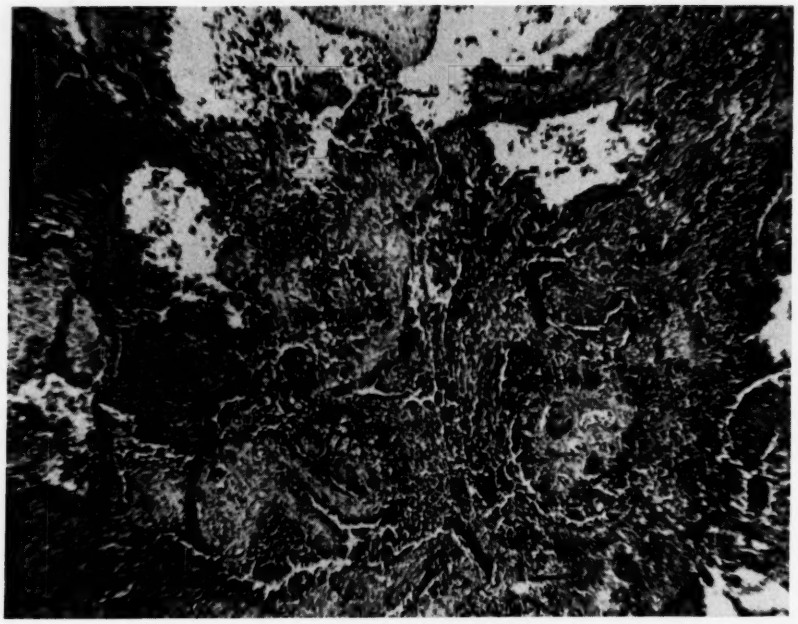


Fig. 3 (Case 1).—Low power magnification of tumor, showing invasion of submucosa by pyknotic cells surrounding stalks, occasional invasion of the veins with tumor cells. Grade 2.

the polyp. The polyp was composed of fibrovascular stroma and covered with transitional epithelium, palisaded and stratified. The cells in some areas were of unequal size and shape, and some possessed nuclei which were hyperchromatic and pyknotic. A few atypical mitoses were present (Fig. 3). The diagnosis was transitional cell carcinoma of the ureter (Grade 2), with hydronephrosis and hydroureter.

This patient was seen at the end of ninety days. He has been symptom free. Urinalysis gave negative results except for 3 to 4 white blood cells in the voided specimen. The blood count was normal. Cystoscopic examination showed the bladder to be entirely free of papilloma.

CASE 2 (L.A.).—C.F.B., a white man aged 54, was admitted to the Kentucky Baptist Hospital under the care of Dr. Atherton, on Oct. 3, 1950. The patient complained of hematuria. The present illness began on September 29 with painless gross hematuria of only a few hours' duration. There were no other symptoms. The patient's health had always been good, and he had had no illnesses other than a low grade chronic sinus infection. A tonsillectomy had been performed in 1928. Otherwise the past history and the family history were irrelevant.

The patient was well developed and well nourished. The temperature, pulse and respiration were normal. The blood pressure in millimeters of mercury was 146 systolic and 74 diastolic. Physical examination revealed no abnormality. The erythrocyte count was 4, 750,000 per cubic millimeter of blood, with a hemoglobin level of 87.6 Gm. and a color index of 0.95; the leukocyte count, 9,300; the differential count was normal. The urine was normal except for 5 or 6 red blood cells on the centrifuged specimen.

A diagnostic cystoscopic examination was performed on September 4 by Dr. Atherton and showed a normal urethra, prostate and bladder. No evidence of tumor, stone or diverticulum appeared. No. 6 catheters passed easily on either side. Intravenous indigo carmine appeared promptly on the right, in six minutes in a somewhat lesser degree on the left. Pyelograms showed a defect in the lower part of the left ureter (Fig. 4). On

October 5 an intravenous pyelogram was taken which showed prompt filling on the right, delayed filling on the left (fifteen-minute film) and again revealed the filling defect. The diagnosis of left ureteral tumor was determined. On October 7 an operation was performed in which, through a Gibson incision, the left ureter was freed and detached, with its orifice and a cuff of the bladder. A transverse kidney incision was made, and the kidney and ureter were removed. No particular difficulty was encountered, and the wounds were closed with rubber tissue drains. Convalescence was uneventful, and the patient was discharged on October 24, the seventeenth postoperative day.

The pathological report revealed the specimen to consist of a normal-looking kidney 10 by 8 by 6 cm., with 22 cm. of ureter. At about the midportion of the ureter was a pedunculated tumor (Fig. 5) 3 by 1 by 1 cm., proximal to which there was dilatation of the ureter, pelvis and calyces. Sections through the tongue of the tumor showed it

Fig. 4 (Case 2).—Ureterogram on left, showing filling defect in lower third typical of papilloma.

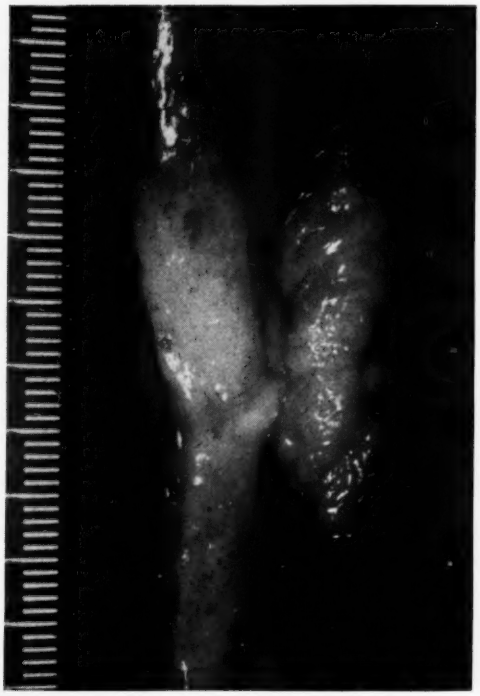


Fig. 5 (Case 2).—Cut section of left ureter and papilloma lifted from its bed but joined to ureteral lining by stalk.

to be composed of fused fronds interlacing in a papillary pattern (Fig. 6). The epithelium was of a stratified transitional type. There were a few scattered mitoses, but little if any metaplasia was observed. There were aggregations of small round lymphocytes throughout the tumor and in the adjacent ureteral wall.

The condition was diagnosed as papillary carcinoma (transitional cell type) of the left ureter. The grade was not given.

This patient was examined cystoscopically at the end of ninety days. The bladder was free of implants. Clinically he was considered well.

SUMMARY

Two cases of primary carcinoma of the ureter preoperatively diagnosed are reported. Both cases fell into the usual clinical pattern, and the patients were treated by removal of the kidney and ureter on the involved side.

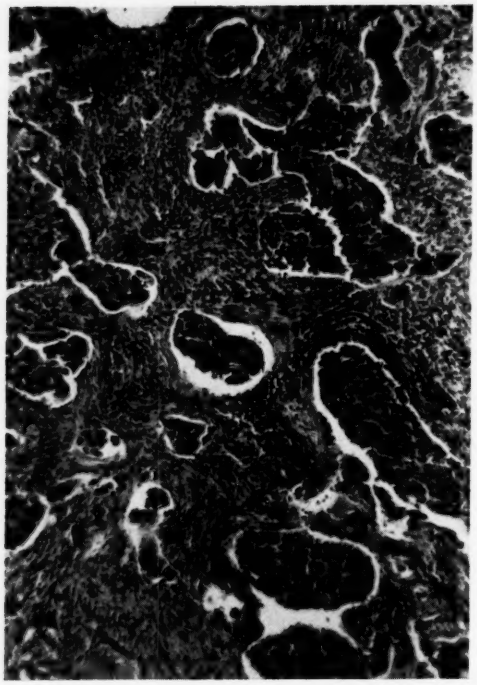


Fig. 6 (Case 2).—Low power magnification of tumor showing stalklike invasion and (lower left) invasion of blood vessel. Also Grade 2.

RÉSUMÉ

On rapporte deux cas de cancer primitif de l'uretère dont le diagnostic avait été fait avant l'opération. L'histoire de ces deux cas est semblable aux autres; les patients ayant subi l'urétéro-néphrectomie.

RESUMEN

Se comunican dos casos de carcinoma ureteral primitivo, ambos diagnosticados preoperatoriamente. Ambos casos presentaron el cuadro clínico de rigor, habiendo sido tratados con la extirpación del riñćn y uréter del lado enfermo.

ZUSAMMENFASSUNG

Es werden zwei Faelle von primaerem Harnleiterkrebs berichtet, die beide vor der Operation diagnostiziert w o r d e n waren. Beide Faelle zeigten das typische klinische Bild und wurden mittels Resektion der Niere und des anschliessenden Harnleiters behandelt.

RIASSUNTO

Sono riportati due casi di carcinoma primario dell'uretere, entrambi diagnosticati preoperativamente. Entrambi i casi si inquadrano nell'usuale aspetto clinico e vennero trattati con nefrectomia ed ureterectomia—

SUMÁRIO

Dois casos de carcinoma primário do uréter, ambos diagnosticados pre-operatoriamente, foram relatados. Ambos os casos cairam dentro da rotina usual de tais casos e foram tratados pela remoção do rim e do uréter do lado atingido.

REFERENCES

1. Rayer, P.: Cited by Higgins, C. C.: Primary Carcinoma of the Ureter, Ann. Surg. 108:271, 1938.
2. Wising, P. J. and Blix, C.: Cited by Shilling, M., and Sondervorst, F. A.: Rev. belge sc. méd., 8:225, 1936.
3. Rousselot, L. M., and Lamon, J. D.: Primary Carcinoma of Ureter, Report of Case and Review of Literature, Surg. Gynec. & Obst. 50:17, 1930.
4. Foard, A. G., and Ferrier, P. A.: Papillary Carcinoma of Ureter; Report of 7 Cases, J.A.M.A. 112:596, 1939.
5. Scott, W. W.: A Review of Primary Carcinoma of Ureter, Presenting 2 Cases, J. Urol. 50: 45, 1943.
6. Pilcher, Frederick: Primary Carcinoma of Ureter, Cana. M. A. J. 57:240, 1947.
7. Gilbert, J. B.: Studies of Natural History of Genito-Urinary Tumors Am. J. Surg. 35:711, 1937.
8. Colston, J. A. C.: Primary Tumors of Ureter, Bull. Johns Hopkins Hosp. 56:361, 1934.
9. Renner, M. D.: Primary Malignant Tumors of Ureter, Surg., Gynec. & Obst. 52:793, 1931.

Rhinoplastic Problems Confronting the Rhinologist

MATTHEW S. ERSNER, M.D., F.A.C.S., F.I.C.S.,
MAURICE H. ALEXANDER, M.D., F.I.C.S.,
AND DAVID MYERS, M.D., F.A.C.S., F.I.C.S.
PHILADELPHIA

SINCE a better understanding of the clinical physiology of the nose has developed and since there has been a gratifyingly increasing interest among otorhinologists in rhinoplastic procedures, physiologic principles are being applied more and more; the nose is considered not merely as an ornament, but as a functioning structure as well.

Physiology of the Nose.—Deformities of the nose frequently interfere with normal physiologic nasal function in that they affect three chief functions of the nose: (1) olfactory, (2) respiratory and (3) phonatory.

1. Anosmia, or a loss of the sense of smell, may well be due either to an obstruction of the nose, such as a deviated septum, or to some degenerative change in the nose itself, such as ozena, involving the olfactory nerve.

2. Any dysfunction in nasal respiration will interfere with the proper filtering and humidifying of inspired air, thus causing predisposition to recurrent rhinitis, sinusitis, etc.

3. The nasal chamber itself is an important factor in voice production; for example, a badly deflected septum may produce a nasal twang in the voice. And further, as has been noted in professional vocalists, the upper and lower lateral cartilages may materially alter the quality of the voice, giving it a thudlike sound without any resonance.

Obviously, proper aeration and ventilation of the nose depends upon normal nasal structure, and it is logical to assume that any impairment in nasal physiologic function may well be due to a deviated septum, a thickened or broad columella, a retracted columella, a drooping tip, a large convex or a markedly concave dorsum nasi, nasal fracture, elongated hypertrophied upper lateral cartilages, flaccid lower lateral cartilages or a lobule distorting the nose sufficiently to disturb both the negative and the positive air pressure. There may also be minor or major anatomic abnormalities in the upper or lower cartilaginous vaults. Any of these anatomic abnormalities, or a combination of them, may distort phonation, which in turn creates abnormal eddies within the nasal fossae. There also may be neoplastic growths, benign or malignant.

There is an abundant literature on the nasal septum. An attempt will be made to classify septal surgery in three eras, namely:

1. *The Orthopedic Era.*—1750, Quellmaltz; 1839, Velpeau; 1839, William of Salicet, who proposed dilatation of nares; 1882, Ingalls, who resected the quadrangular cartilage; 1886, Krieg, R., who extended the resection of bone; 1889, Roberts, J. B., who punctured a piece out of the septum.

2. *The Classic or Orthodox Era.*—1890, Killian; 1905, Freer; 1906, Ballenger, W. L.; Yankauer; Sluder; Dunning; MacKenzie; Douglass; MacKenty.

3. *The Fluid or Contemporary Era.*—1929, Metzenbaum; Galloway; Fomon and Gilbert; Cottle and Loring; Bolotow; 1944-48, Ersner.

The last two decades of the nineteenth century witnessed the development of two great schools of thought in regard to the

From the Department of Otorhinology and Rhinoplastic Surgery, Temple University Hospital.
Read at the Fourteenth Annual Assembly, United States Chapter, International College of Surgeons, Atlantic City, Nov. 9, 1949.
Submitted for publication Dec. 11, 1949.

function of the nasal septum and the respect with which it is to be treated. The first school, of which Asch was the foremost champion, preached that the cartilage of the septum should be preserved by destroying its resiliency and forcing it back into its proper place. The second school held that the septum is a mere partition and serves no physiologic function. On this premise Ingalls originated the operation of submucous resection of the quadrangular cartilage in 1882. Krieg in 1886 extended the operation by including in the resection the vomer and the perpendicular plate of the ethmoid bone. This operation was further developed by Freer and Yankauer and was finally perfected by Ballenger with his invention of the swivel knife. It then became a free-for-all because of the ease of the operation. In the hand of the master Asch, good results were obtained with Sluder's operation. His method consists in the making of three parallel longitudinal incisions through the mucous membrane and cartilage on the side of the convexity and the pushing over of the upper piece of cartilage so that it overrides the lower, in order to overcome the resiliency of the three pieces. Gleason's U-shaped flap operation had its advocates. Although submucous resection was hailed as the great modernizing step in nasal surgery, it was soon realized that many failures and a few disasters were encountered.

That perfection was not attained by submucous resection is evidenced by the fact that Lowe created a sensation in 1905 by his operation, decortication of the face. His method consisted of making an incision through the gingival-buccal fold of the upper lip, extended from the first molar on the one side to that on the other, and clear to the bone. The soft parts were then separated from the bone until the under border of the pyriform fossa was in view. The inferior and anterior borders of the cartilaginous septum were then denuded of the soft parts by means of shallow longitudinal incisions along the anterior nasal spine. The mucous membrane was not perforated, as the whole operation was extranasal. A raspatory, bent on the flat, was then inserted beneath the inferior turbinate, and from that point the lateral nasal wall, the nasal floor and the septum were undermined. The nasal floor was invariably loosened first so as to avoid tearing of the mucous tube. After elevation of the mucous membrane, the anterior parts of the quadrangular cartilage were exposed. Deformities in the anterior segment of the septum could then be removed. This constitutes an important part of the modern conception of reconstructive surgery, namely, the mobilization of the external portion of the nose.

In recent years successful reconstructions of the deformed nasal septum have been devised by MacKenty, Metzenbaum, White, Peer, Galloway, Cottle and Loring, Fomon and Gilbert, Bolotow and Ersner. We attribute our success to the fact that we have immobilized the septum, employed struts and battens, prevented flaccidity of the septum by means of one or more cartilaginous implantations and minimized scar tissue formation by means of epithelialization; last but not least, we have taken into consideration the columella, which is part of the septum and therefore an essential factor in septal reconstruction.

Anatomic Relations. — In considering the anatomic relation of the deviated septum to other nasal deformities one must always bear in mind that normal physiologic nasal function is dependent upon normal anatomic relations.

For academic purposes, an anatomic outline is presented to show the relation of a deviated septum to other nasal deformities:

1. Deformities limited to the septum:
   - (a) Osseous septum:
     ethmoid bone, vomer, maxillary spine
   - (b) Cartilaginous septum:
     quadrangular cartilage
     vomeronasal cartilage
     mesial crura
   - (c) Columellar septum
2. Septal deformities with involvement of contiguous structures:

(a) Osseous vault: (1) nasal bones; (2) frontal process of the superior maxilla
(b) Upper lateral cartilaginous vault
(c) Lower lateral cartilaginous vault (lateral and mesial crura)

While it is the chief concern of the otorhinologist to restore normal physiologic function, he must never lose sight of the ever present and all-important esthetic factor. To correct an obstruction of the nose in order to reestablish proper aeration and drainage may call for an operation on the septum, such as a typical submucous resection. This, however, may not be adequate to establish full physiologic function. As physiologic concepts change, so do rhinoplastic procedures. Thus, it may also be necessary to elevate the nasal tip, correct the columella, revise the bony framework, and alter the upper and lower lateral cartilages. These are many of the numerous problems that fall into the domain of the contemporary otorhinologist; therefore, it is necessary to perform a combined operation, or a one-stage surgical procedure combining submucous resection and nasal reconstruction, to establish normal physiologic function as well as to attain a good cosmetic result.

Injury to the nose is a frequent occurrence. Because of its unprotected position and its projection, the nose is more vulnerable to trauma than is any other portion of the face. Nasal injuries may occur at birth, during childhood or during adult life.

Injuries of the nose may be external, endonasal or both. Nasal injury may also involve the soft structure, the cartilaginous structure, the mucous membrane or the bone.

A fractured nose is the most prevalent type of injury. Fractures may be unilateral, bilateral, linear, comminuted, convex or depressed. Unfortunately, nasal injuries are too often treated rather complacently and without receiving the attention they warrent. Supposedly trivial nasal injuries often are the forerunners of serious extranasal and intranasal involvement. When a nasal injury occurs, the general practitioner ordinarily administers palliative treatment of the epistaxis, bloody ooze, edema and ecchymosis, but may unfortunately overlook the possibility of a fracture. Frequently it is not until the patient begins to complain of an obstruction that he is sent to the rhinologist. This practice has its undesirable aspects, as once the fragments of the bone and cartilage have become fixed it is too late to elevate the fracture. Sometimes the fragments of bone have become so displaced that they obstruct breathing, interfere with the patency of the nose or act as trigger points. They may also create an impediment to drainage and involve the sinuses. This may produce a typical picture of nasal physiologic dysfunction as well as a resultant external nasal deformity. One must always remember that the elevation or the resetting of a nasal fracture must be done promptly, and in the early stages of the healing process. The best time is within the first few days following the injury, and before the fragments can become fixed in the wrong position.

When the rhinologist is called to correct an acute compound nasal fracture with external lacerations, the area should be cleansed of all debris and all foreign bodies should be meticulously removed so as to prevent tattooing of the skin. Primarily, the fracture should be reduced before the external wound is sutured, as otherwise the sutures may be loosened or torn from their mooring. Another precaution is to handle the tissues gently, avoiding a rat-tooth forceps, clamps or hemostats and preferably employing small dural hooks to help approximate the separated tissues. Wherever possible, the subcutaneous and soft tissues should be brought together before the external cutaneous wound is sutured.

Once the injured structures have become fixed in the wrong position, the surgeon may be confronted with a septal dislocation that deprives the tip of the

nose and the columella of support. This causes a drooping of the tip and distortion of the columella.

The septum is more vulnerable to injury than is any other nasal structure. Clinical observation has shown that many septal deviations are associated with external nasal deformities, and rarely does one encounter a nasal disfigurement in which the septum is not involved. True, some nasal deformities are the result of congenital malformations, heredity factors, or disease, such as syphilis, atrophic rhinitis and/or ozena. By and large, however, most nasal deformities are due to trauma.

Functionally as well as esthetically, the internal portions of the nose are integral parts of the external nasal pyramid. It must be kept in mind that normal physiologic nasal function is dependent upon normal anatomic relations. Any distortions within these structures may interfere with phonation, breathing, aeration, olfaction, humidification, ventilation, sinus drainage and, last but not least, nasal conformity. The following are some of the factors responsible for nasal dysfunction which may be corrected rhinoplastically: deflected septum, thick columella, flaccid alar or lower cartilages, concave or convex alae, hypertrophied upper and lower lateral cartilages, and immobile or frozen intercartilaginous aponeurosis (plica limen nasi) located between the upper and lower lateral cartilages.

A plastic operation on the septum consists of resecting or removing the obstruction, whether it exists at the anterior or the posterior portion of the septum. When correction and elevation of a drooping nasal tip is considered, one often finds that the external portion of the nose is normal but the buttress part of the septum is causing obstruction.

At one time it was believed that a saddle nose which followed a submucous resection was due to complete skeletization of the septum; rhinologists could not understand why, entirely apart from syphilitic or traumatic factors, a saddle nose developed in some patients and not in others. Today we can explain the reason for this deformity. This result occurs in patients with the platyrrhine nose in which the upper lateral cartilages are short in their relation to the quadrangular cartilages of the septum, and the shortness of the upper lateral cartilages rather than the submucous resection was responsible for production of the saddle nose. Should the nose still be depressed after the upper lateral cartilages have been repositioned over the dorsum nasi, it becomes necessary to take the cartilage that was removed from the septum and implant it over the sewed lateral cartilages to fill in the concavity. If the upper lateral cartilages are long and their attachment extends forward and toward the caudal end of the septum, a saddle or a concavity in the ventral portion develops after submucous resection.

A further prophylactic measure against saddle nose is to sew either the upper lateral cartilages over the dorsum nasi (ventral portion of the nose) and/or place a cartilage batten to fill in the concavity.

The nose requires rigid and semirigid structures in order to permit normal nasal respiration. The semirigid structure is anterior, while the rigid or bony structure, consisting of the perpendicular plate of the ethmoid and vomer, is posterior. Nature evidently anticipated that injury to the nose would occur, and accordingly placed the semirigid structure anteriorly to act as a natural buffer and to absorb some of the shock. If the septum is involved, early correction of its cartilaginous portion should be instituted before fibrosis takes place. By early correction the danger of faulty development of the face can be avoided. This is particularly true of injuries to children. Metzenbaum, who pioneered in this work, attempted correction of the septum by replacing it in its proper position; he failed, however, because he did not completely immobilize the cartilaginous part of the septum.

Bowing of the septum may be the result of injuries when the external deformity has been corrected and the septum neglected.

It appears that when vital air plays an essential role it is necessary to have an osseous and semirigid structure and musculature. The cartilaginous part of the septum is such that when air enters into the nose there is a sway of this part in response to the air current. Concomitant with this are the movements of the upper and lower lateral cartilages and the intercartilaginous aponeurosis. When complete submucous resection is performed, the semirigidity and rigidity are gone and only a flaccid membrane remains. This changes the air current and produces eddies. After submucous resection, therefore, it is important to replace straight, small, thin pieces of cartilage between the septal mucous membrane flaps so as to reestablish semirigidity.

The saddle nose resulting from submucous resection is caused by contraction of the scar tissue, which exerts an extra strain pulling the nose downward, thus creating the familiar effect. To overcome this, the line of septal incision is epithelialized by suturing the free septal mucous membrane so as to promote primary healing. A straight, small piece of cartilage is replaced between the mucosal flaps to help support and eliminate the stress. The cartilage will then act either as a strut or as a batten.

Cottle and Loring, in a recent publication, stated that they place small pieces of cartilage which in effect act like a series of Z-plastic flaps. This diminishes the possibility of postoperative scar formation and contraction.

Other Nasal Deformities.—It is the aim of the rhinologist to achieve functional physiologic efficiency as well as structural balance in cases of (1) a twisted or scoliotic nose; (2) a drooping nasal tip; (3) a thickened or wide columella, and (4) crushing injuries with adhesions and synechia.

1. A twisted or scoliotic nose may be the result of a deformity of the lower third of the nose or the cartilaginous vault. In this case, only the septum and the upper or lower lateral cartilages are operated upon. When the twisted nose is due to a bony displacement a complete rhinoplasty may be necessary.

2. A drooping nasal tip interferes with nasal respiration. To demonstrate this point, place the thumb or one of the fingers at the nasal tip and elevate the tip upward. When the tilt reaches the proper elevation, the patient will tell you that his breathing has improved. By the same token, this can be accomplished surgically through the transfixion route with or without submucous resection. A drooping tip and/or a retracted columella due to the lack of support can be avoided by means of (a) a columellar strut and (b) suspension of the columella to a higher level. The suspension is accomplished with either orthopedic or hammock sutures. The nasal septum or the upper lateral cartilages may be utilized as the fulcrum for the suspension.

3. The columella is an integral part of the septum. Thickening or widening of the columella may be due to protrusion of the nasal spine, thickened subcutaneous tissue, displaced mesial crura, etc., which interferes with normal nasal respiration. In order to improve physiologic function, rhinoplastic procedures must be instituted.

4. To improve nasal respiration after crushing injuries in which the nose has been almost completely flattened, no rhinoplastic procedure should be considered until one has overcome the stenosis by breaking up the adhesions and synechia. This is accomplished by skin-grafting the interior of the nose (Sano-method). The graft is held in place by packing, stent or rubber foam. After this is accomplished one can readily graft bone or cartilage to elevate the nose. The procedure has served a twofold purpose, producing both physiologic and cosmetic improvement.

Physiologic Function of the Upper and Lower Lateral Cartilages and Their Relation to the Septum.—The ventral borders of the upper lateral cartilages are continuous with, and form the wings of, the nasal septum. During respiration they act as fluttering valves. The caudal ends of the upper lateral cartilages

are brought close to the septal cartilage upon inspiration (negative pressure), thus diminishing the inlet of the air and so helping proper distribution of the air supply into the nose. It is well known that they move and vibrate and act as a partial valve. One can feel the vibrations upon humming and easily see the extent of their mobility upon deep inspiration and expiration. They also contribute to facial expression.

The lower lateral cartilages are horseshoe-shaped and consist of a mesial crus, a dome and a lateral crus. The mesial crus lies in the columella; the lateral crus extends halfway down the lobule, while the crura act as a dome. The lower lateral cartilages help to keep the nose and vestibule open. In normal position the cephalic end of the ala overrides the caudal end of the upper lateral cartilages. During inspiration the caudal portion of the ala (lower lateral) is everted and the cephalic end inverted, thus creating pressure upon the caudal end of the upper lateral cartilages. This action creates a fluttering valve, narrowing the orifice of the roof of the vestibule, and thus aids in better distribution of the air into the nose and into the pulmonary structures. This physiologic action is well explained by Baronelli's law. When the ala is narrowed so as to cause further reduction of the size of the vestibule, the volume and velocity of the air intake is changed. A wide, roomy nose is not necessarily conducive to the proper volume of air intake and distribution. Normally, the nose is provided with upper and lower lateral cartilages which act as valves, and the elliptical nares act as pressure slits or chinks through which the inspired air is forced and distributed. For this reason wide nares, which are encountered in patients with ozena, are frequently narrowed in order to improve the synergistic action of these "fluttering valves".

In the presence of dislocation, distortion, hypertrophy or atrophy of these cartilages there is interference with normal physiologic function and only rhinoplastic procedures will help to create it. The most important diagnostic point in atrophic the treatment of upper and lower lateral cartilages is the inability to breathe deeply through the nose. This can be observed on deep inspiration when the cartilages impinge upon the septum and interfere with the ingress of air. The intercartilaginous aponeurosis is of extreme importance because it permits the action of the upper and lower lateral cartilages. A "frozen" aponeurosis due to scar tissue or injury will interfere with the cartilaginous movements, resulting in faulty air intake, poor distribution of air in the nose and improper phonation.

In rhinoplastic surgical procedures one must be careful not to fix or create a "freezing" of the intercartilaginous aponeurosis, because it will distort the position of the upper and lower lateral cartilages and result in faulty action. This may also occur after submucous resection.

The rhinoplastic procedures to establish normal physiologic function consist of replacing parts, resetting parts, removing any obstruction to improve the direction of air currents, mobilizing and repositioning parts, shortening the septum, resecting the septum, narrowing the columella by means of removing subcutaneous tissue and suturing the raw surfaces together, fixing the columella in the proper position, elevating a drooping tip, removing any convexity, filling in any concavity, trimming parts, fitting parts and preserving all tissue wherever possible. One must avoid unnecessary scarring; epithelialize all raw surfaces so as to minimize scar formation; make the appropriate correction and, if necessary, approximate the upper and lower lateral cartilages to the general conformation of the reconstructed nose; insert a strut or batten for support of the columella, and preserve the plica limen nasi in order to prevent freezing or fixation of the aponeurosis.

Septal Abscess.—This lesion should be mentioned among problems that confront the rhinologist. Although septal abscess may or may not be a rhinoplastic problem, it is frequently encountered.

A septal abscess is usually secondary

to an infected hematoma and should receive prompt treatment; otherwise it may lead to destruction of the septum, with subsequent perforation and loss of the dorsal support. The abscess should be incised for evacuation of the infected material. Suction should be employed to remove the debris and the sequestra. A small piece of packing should be inserted between the mucosal layers for forty-eight hours. In the interim antibiotics and biochemicals should be administered parenterally.

As soon as the infection subsides, which may be within two or three days, an autogenous or isograft cartilage should be inserted between the layers of the mucous membrane. This precaution, will prevent the development of flat, broad saddle nose.

In 2 instances, one of us (M. S. E.) implanted tantalum plate between the mucosal layers. The results to date have been encouraging, but the patients are still under observation.

It would be interesting to note the effect of tantalum plate implantation in a case of sepal perforation, but we have not employed this procedure.

SUMMARY

Prevention of complications must be the paramount objective of all operative procedures. Although the incidence of failure has been reduced to a minimum, physiologic failures in rhinoplastic procedures still occur, and means to avoid some of these are herewith given.

1. *Drooping of Nasal Tip.*—When the septal cartilage is protruding caudally, producing a drooping of the nasal tip, removal of a triangular piece of cartilage from the caudal end of the cartilaginous portion of the septum is necessary, and with an orthopedic suture the columella is suspended upward, the septal part of the cartilage being used as the fulcrum to elevate the nasal tip.

2. *Septal Perforation.*—Perforation of the septum, although it causes little disturbance, involves discomfort and may give rise to a whistle, air eddies, crustations, scabs or epistaxis. The perforation may be corrected surgically or by epithelialization. One procedure is to epithelialize the septal mucous membrane in the line of incision. Another is to incise the septal mucous membrane so as to form a flap to cover the perforation. This flap is retained in place by sutures, by packing, or by packing with oxycel cotton or gelfoam. Dental compound packing may also be employed.

For an old perforation when a flap is not available it is best to freshen the edges of the perforation and also to abrade the turbinal mucous membrane on one side. The septum is then pushed over to the abraded side and packed with gauze on the nonabraded side. The packing is left in place for about a week, until adhesions and a synechia form between the septum and the turbinal mucous membrane.

The next stage in this procedure is to detach the septum from the lateral nasal wall. The lapse of time is purely elective. The septum is then detached. The bleeding surface from the turbinate is electrocoagulated and the septum remains *in situ* without the perforation. In other words, the perforation is filled in with mucous membrane, the turbinal mucous membrane acting as the donor.

Whistling respiration may be eliminated either by enlarging the opening or by obliterating the perforation as just described.

3. *Air Eddies.*—Normally, the septum is a rigid mucomembranocartilaginous and osseous structure dividing the nose into two parts. In a number of instances we have noted that instead of the septum being rigid, it was flaccid, and the flaccid septum changed position with inspiration and expiration, thus creating eddies. Air eddies can be eliminated by electrocauterization along the floor of the septum, creating scar formation, and thus the septal mucous membrane becomes more taut.

4. *Scar Formation, Scar Contraction and Synechiae.*—These conditions can be avoided by epithelialization or by various types of packing which prevent roughened

edges from adhering. The packing may be made up of vaseline gauze or dental compound.

5. *Scabs and Crustations.*—Crustations and scabs occur only when there is a perforation or where there is roughened abraded tissue. Crustations may be softened with hydrogen peroxide and olive oil. All granulations and abraded areas should be cauterized.

6. *Epistaxis.*—The incidence of hemorrhage has been greatly reduced because of preoperative and postoperative care and the administration of vitamins K and C. Should epistaxis occur postoperatively, it is important that the bleeding area be located. One may employ electrocoagulation, the actual cautery, injection of sclerosing solutions into the bleeding area or packing of the bleeding surface with oxycel or gelfoam.

CONCLUSIONS

1. Deformities of the nose frequently interfere with normal physiologic nasal function.

2. The most prevalent injury to the nose involves the septum.

3. Normal physiologic nasal function is dependent upon anatomic relationships.

4. Although submucous resection is a modern step in intranasal surgical procedure, it is only one of the phases of nasal reconstruction.

5. The importance of adjusting the upper lateral cartilages to the septal cartilage in order to establish proper respiration cannot be overemphasized.

6. In cases in which the lower cartilaginous vault is involved, it is obvious that submucous resection alone will not improve respiratory function unless the lower cartilaginous vault is corrected.

7. In cases in which a saddle nose is present preoperatively the septal cartilage which is removed during submucous resection should be utilized and transplanted in order to fill in the concavity.

8. To prevent flaccidity of the septum after submucous resection, it is essential to replace a segment or segments of the resected septum between the flaps of the mucous membrane; this will lend rigidity and semirigidity to the septum and thus minimize oscillations and eddies.

9. Interseptal cartilaginous transplants prevent contractures.

10. The advantages of the transfixion approach over the orthodox method of correction or reconstruction of the deformed nasal septum are manifold, in that submucous resection can be accomplished with greater ease and under direct vision.

11. It is the aim of the otorhinologist to achieve nasal functional efficiency as well as structural balance by means of rhinoplastic procedures.

RÉSUMÉ ET CONCLUSIONS

1. Les déformités du nez nuisent fréquemment à son bon fontionnement.

2. La blessure la plus fréquente intéresse le septum.

3. Le fonctionnement normal du nez dépend de son anatomie.

4. Même si la résection sous-muqueuse est un procédé moderne de chirurgie intranasale, elle ne présente qu'une partie de la réfection nasale.

5. On ne peut trop insister sur l'importance de bien replacer les cartilages latérosupèrieurs pour une bonne respiration du nez.

6. Dans les cas où la voûte cartilagineuse inférieure est intéressée, il est évident que la sous-muqueuse seule est insuffisante pour rétablir une bonne voie aérienne à moins de corriger cette voûte cartilagineuse inférieure.

7. Dans le cas de nez en selle, le septum cartilagineux qui est réséqué devrait être utilisé comme greffe pour combler la concavité.

8. Pour prévenir la flacidité du septum après une résection sous-muqueuse, il est essentiel de remplacer un ou plusieurs segments entre les volets de la muqueuse. Ceci obvierait aux oscillations en le rendant plus rigide.

9. La transplantation de cartilages prévient la constriction.

10. Les avantages de cette méthode par transfixion sur la méthode orthodoxe pour

corriger ou refaire un septum nasal déformé sont supérieurs par le fait que cette résection se fait plus facilement et avec plus de visibilité.

11. Le but de l'otorhinologiste est d'atteindre une excellente aération en même temps que de conserver une apparence conforme du nez par les moyens de chirurgie rhino-plastiques.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Formveraenderungen der Nase beeintraechtigen haeufig die normale physiologische Nasenfunktion.

2. Am haeufigsten wird die Nasenscheidewand von Verletzungen betroffen.

3. Die normale Funktion der Nase haengt von anatomischen Verhaeltnissen ab.

4. Die submukoese Resektion ist zwar ein neuzeitiges Verfahren in der Nasenchirurgie, stellt aber nur eine Phase in der Wiederherstellung der Nase dar.

5. Es kann nicht genuegend hervorgehoben werden, wie wichtig die Angleichung der oberen Seitenknorpel an die knorplige Scheidewand zur Herstellung ausreichender Atmung ist.

6. Es ist klar, dass, wenn das untere Knorpelgewoelbe verletzt ist, die submukoese Resektion allein ohne Korrektur des unteren Knorpelgewoelbes die Atmungsfunktion nicht verbessern kann.

7. In Faellen, wo vor der Operation eine Sattelnase besteht, sollte der bei der submukoesen Resektion entfernte Septumkorpel zur Ausfuellung der Konkavitaet benuetzt und transplantiert werden.

8. Zur Vermeidung einer Erschlaffung der Nasenscheidewand nach submukoeser Resektion ist es wichtig, ein oder mehrere Segmente des resizierten Septums zwischen die Schleimhautlaeppchen wieder einzusetzen; dadurch wird der Nasenscheidewand Starrheit oder Halbstarrheit verliehen und das Auftreten von Vibrationen und Wirbeln verringert.

9. Durch die Einpflanzung von Septumknorpel werden Kontrakturen verhindert.

10. Die Vorteile der Durchstechungsmethode gegenueber der orthodoxen Korrektur der deformierten Nasenscheidewand sind mannigfach, weil die submukoese Resektion mit groesserer Leichtigkeit und unter direkter Leitung des Auges ausgefuehrt werden kann.

11. Das Ziel des Otorhinologen besteht in der Erreichung funktioneller Tuechtigkeit und strukturellen Ausgleichs der Nase mit Hilfe von rhinoplastischen Verfahren.

RIASSUNTO E CONCLUSIONI

1. Le deformita' del naso frequentamente intervengono alla funzione normale fisiologica nasale.

2. La lesione piu predominante nel naso attacca il setto.

3. La funzione normale fisiologica nasale e' dipendente sul parentado anatomico.

4. Sebbene resezione sottomucosa sia un passo moderno nel procedimento chirurgico intranasale, e' soltanto una fase nella ricostruzione nasale.

5. L'importanza di aggiustare le cartilagini superiori laterali al cartilagine settale affine stabilire respirazione convenevole non si puo' pronunziar forte.

6. Nei casi in cui il cavo cartilaginoso inferiore e' compromesso e' evidente che resezione sottomucosa per se non migliorera' facolta' respiratoria fuorche' il cavo cartilaginoso inferiore sia corretto.

7. Nei casi in cui un naso a sella é presente pre-operatorio, la cartilagine settale che e' rimossa durante resezione sottomucosa dovrebbe essere utilizzata e trapiantata affine di occupare la concavita'.

8. Per prevenire flaccidita' del setto dopo resezione sottomucosa, e' essenziale ricollocare un segmento o segmenti del setto risecato fra le falde della membrana mucosa; questo prestera' rigidita' e semi rigidita' al setto e cosi minima oscillazione e gorghi.

9. Trapianti cartaliginosi intersettali impediscono retrazioni.

10. I vantaggi del accesso a trasfiggere sopra il metodo ortodosso di correzione o ricostruzione del setto nasale difforme sono numerosi val a dire resezione sottomucosa

si puo' effecttuare con piu' facilita' e sotto visione diretta.

11. E'lo scopo del otorinologo di acquistare efficiente funzione nasale bene che bilancia di struttura per modo di procedimenti rinoplastici.

SUMÁRIO E CONCLUSOES

1. As deformidades do naris interferem frequentemente com as funções nasais fisiologicas normais.

2. O traumatismo mais comum do nariz involve o septo.

3. As funções fisiologicas do nariz dependem das relacões anatomicas.

4. Ainda que a ressecção submucosa seja um avanço entre os processos circurgicos intranasais, e' somente uma das fases da reconstrucão nasal.

5. A importancia de se ajustar as cartilagens supero-externas a' cartilagem septal de modo a' estabelecer bôa respiraeção não di ve ser exagerada.

6. Em casos nos quais a aboboda cartilaginósa inferior está envolvida, e' obvio que a ressecção submucosa, em si somente, não melhóra a funcão respiratoria, a menos que a arcāda cartilagino'sa inferior seja corrigida.

7. Nos casos em que um nariz em séla e' notado pre-operatoriamente, a cartilagem septal que e' removida durante a ressecção submucósa deve ser utilizada e transplantada, de módo a encher completamente a concavidade.

8. Para prevenir flacidêz do septo depois da ressecção submucósa é essencial recolocar o segmento ou os segmentos do septo ressecado entre as beiradas da membrana muco'sa; isto emprestará rigidez e semirigidez ao septo e assim diminuirá oscillações e redemoinhos.

9. Os transplantes cartilaginosos interseptais evitam contraturas.

10. As vantagens da abordagem por transfixão sobre o método orthodoxo de correção ou reconstrucão do septo nasal deformado são m u l t i p l a s porque a ressecção sub-muco'sa po'de ser executada com a maior facilidade e sob visão diréta.

11. E'objetivo do oto-rino-laringologista conseguir eficiente funcionamento nasal tanto quanto equilibrio das estruturas por meio de processos rinoplasticos.

RESUMEN Y CONCLUSIONES

1. Las deformidades nasales interfieren frecuentemente la función nasal fisiológica normal.

2. La lesión nasal predominante interesa el tabique.

3. La función nasal fisiológica normal es expresión anatomofuncional.

5. Debe recalcarse la importancia de ajustar los cartílagos laterales superiores al tabique para establecer respiración adecuada.

6. En casos en que la bóveda cartilaginosa inferior se encuentra interesada, es evidente que la sola resección submucosa no mejorará la función respiratoria a menos que la bóveda cartilaginosa inferior sea corregida.

7. En casos de existencia preoperatoria dena riz en silla de montar, el tabique removido durante la resección submucosa debe utilizarse transplantándolo para llenar la concavida.

8. Para prevenir la flacidez del tabique por la resección submucosa, es esencial reemplazar un segmento o segmentos del tabique resecado entre los colgajos de la mucosa, lo que dará rigidez o semirigidez al tabique y por ende disminuirá las oscilaciones y desviaciones.

9. Los transplantes cartilaginosos interseptales previenen contracturas.

10. Las ventajas de la vía por transfixión sobre el método ortodoxo de reconstrucción o corrección del tabique nasal deformado son numerosas, pudiéndose efectuar la resección submucosa con mayor facilidad y a la vista.

11. El otorrinolaringologista debe obtener eficiencia funcional nasal tanto como equilibrio estructural por procedimientos rinoplásticos.

Fractures of the Forearm

WILLIAM JOHNSON, M.D., F.A.C.S., F.I.C.S., R. G. HICKERSON, M. D.,
B. E. MALSTROM, M.D., AND E. G. BEHRENTS, M.D.
GALESBURG, ILLINOIS

IT has been stated, "There is no more distressing sight than that of stiff, shiny, atrophic fingers following a well-reduced wrist fracture, and there is no patient more difficult to rehabilitate."

Fractures of the forearm are among the most common and most frequent bone injuries. To obtain positive results in patients of all age groups, and in all fractures of the forearm except those that can be maintained with casts, those in the vicinity of the elbow joint and those in which there has been damage to the nerves or blood vessels at the time of injury, a technic has been adopted which has proved satisfactory in a series of 71 cases.

As in all successful fracture management, it is required, first, that the fracture be reduced; second, that the reduction be maintained, and third, that function be restored. In considering the first and second dicta of fracture management, the technic of reduction and its maintenance is the same in this series.

The patient is placed supine on the fracture table with the hand suspended by means of a finger trap attached to an overhead bar (Fig. 1). Countertraction is obtained by weights attached to the upper arm, which is held at right angles to the suspended forearm. The amount of weight used is sufficient to create 15 pounds (6.8 Kg.) of countertraction, which is indicated on the spring scale. In most cases this amount of weight maintained for approximately fifteen minutes will cause sufficient muscle fatigue and relaxation to permit the fragments to assume a normal anatomic position. The lines of force are directed through the center of the shaft of the radius. This technic is applicable to any fracture of the upper, middle or lower third of the radius, except fracture of the head and neck. In fractures of the shaft of the ulna the line of traction force would be shifted to the ulnar side by shifting the spring scale on the chain.

In fractures of both bones of the forearm it is mandatory that the ulnar fracture be reduced and fixed first, since the ulna is the fulcrum around which rotation of the forearm occurs. After the ulnar fracture has been reduced and fixed, the spring scale is shifted on the chain so that the lines of force are shifted to the radial side. The injured arm should be suspended in such a way that it may be approached for additional digital manipulation or open reduction as the case may require. In such an event the position of the arm need not be changed.

Rigid fixation with firm apposition of the fragments creates a physiologic state conducive to early firm union, and this is obtained by dual pinning and external bar fixation. The site of insertion of the pins depends entirely upon the site of the fracture (see illustrations). It is obvious that a fracture fixed in this manner permits greater freedom of the adjacent joints. The dressings around the pins are not attached to the skin; therefore there is no drag on weakened muscles and no tendency toward complicating conditions that may be provoked by immobilization. The patients are urged to resume their normal habits, such as feeding themselves, writing, or driving a car or tractor. Active motion is the best means of restoring function.

After removal of the pins there are various types of treatment available, all coming under the classification of physio-

Read at a meeting of the Ambulatory Fracture Association, Toronto, Ontario, Canada, October 1949.
Submitted for publication May 27, 1951.

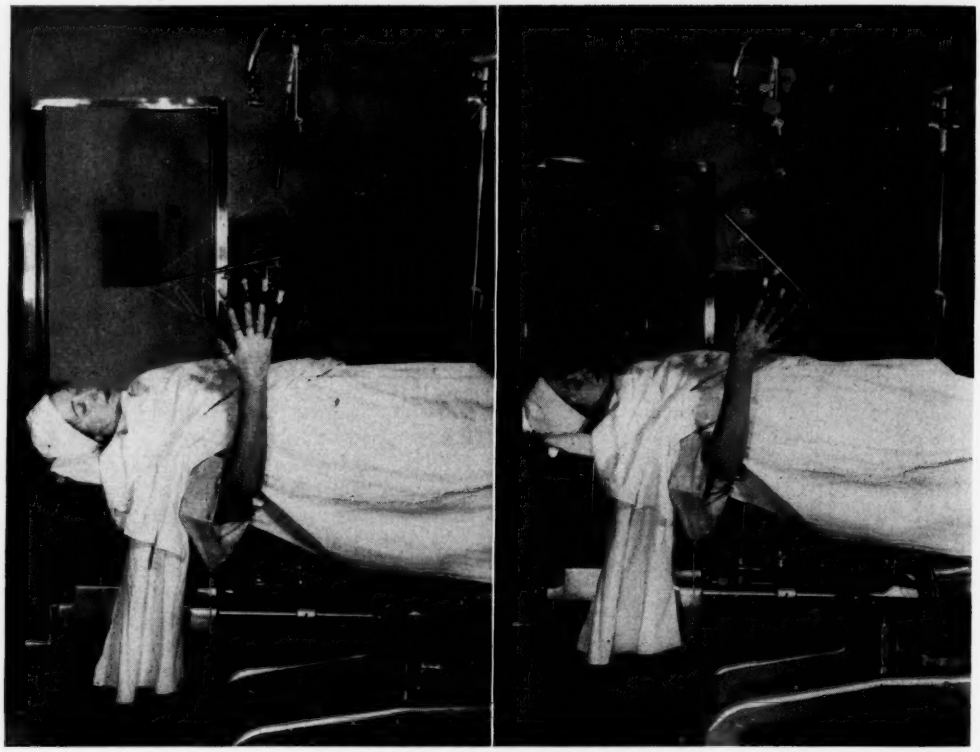


Fig. 1.—Patient in position on fracture table.

therapy. Massage has its place, but usually some form of active motion is preferred. Heat is of great value for its analgesic action and stimulation of the circulation. Physiotherapy is resorted to when the patient needs assistance in restoring normal function.

Illustrative Cases.—The following cases are pictorially presented to illustrate the different types of fractures of the forearm reduced and maintained by the technic just described.

Figure 2, *A* and *B*, illustrates a comminuted Colles' fracture, showing a flattening and dorsal tilt of the wrist joint with a fracture of the ulnar styloid.

The fracture was reduced and the normal angles of the wrist joint restored (Fig. 2, *C* and *D*). The comminuted fragments have assumed an almost perfect anatomic relation, and the articular surface is again smooth. Dual pins are shown in the metacarpal bone of the thumb, and counterdual pins are visible in the radius proximal to the fracture. Double bar fixation is employed between the pins.

Figure 3 shows the wrist with the dual pins and double bars in place. Note the normal contour of the forearm at the wrist and the minimal swelling. This patient returned to his work as a painter one week after injury.

Figs. 4 and 5 illustrate a similar fracture, for which a through-and-through pin was used in the metacarpal of the thumb, with a U-bar attached to the metacarpal pin.

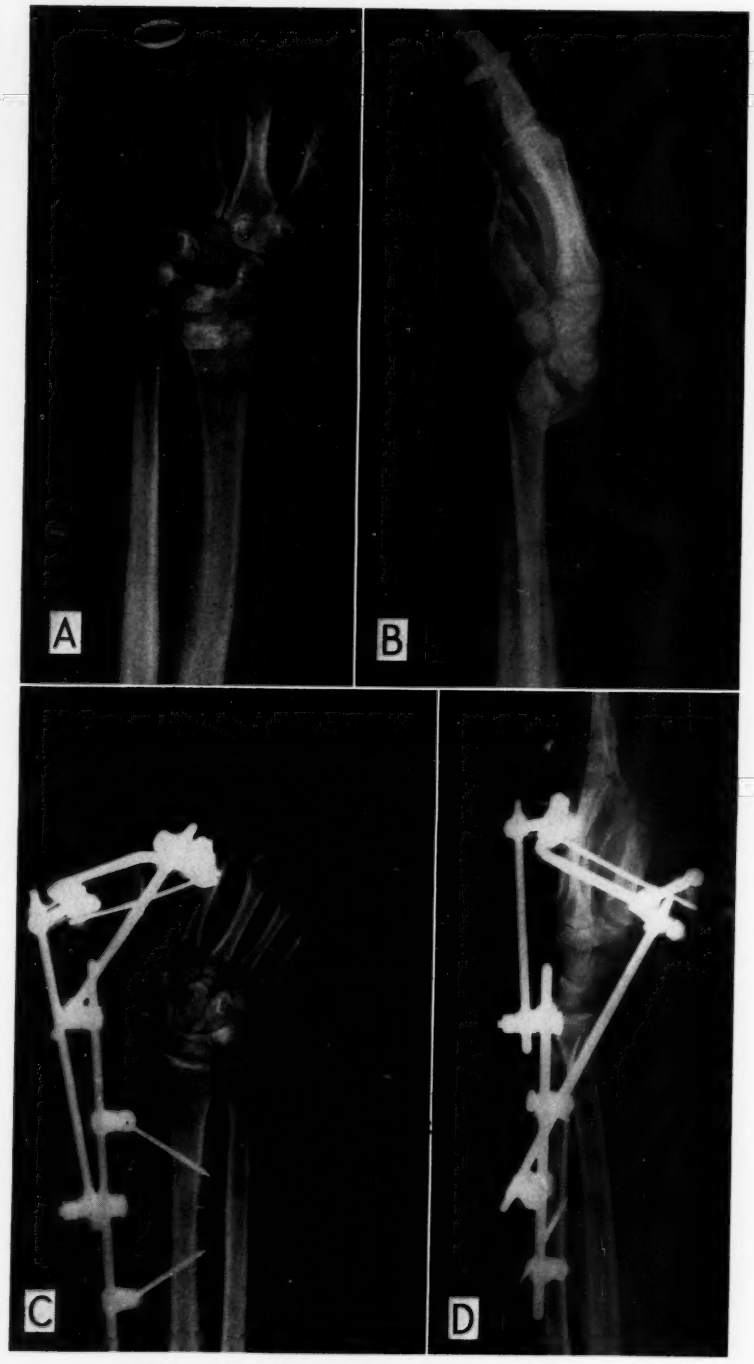


Fig. 2.—Comminuted Colles fracture (see text).

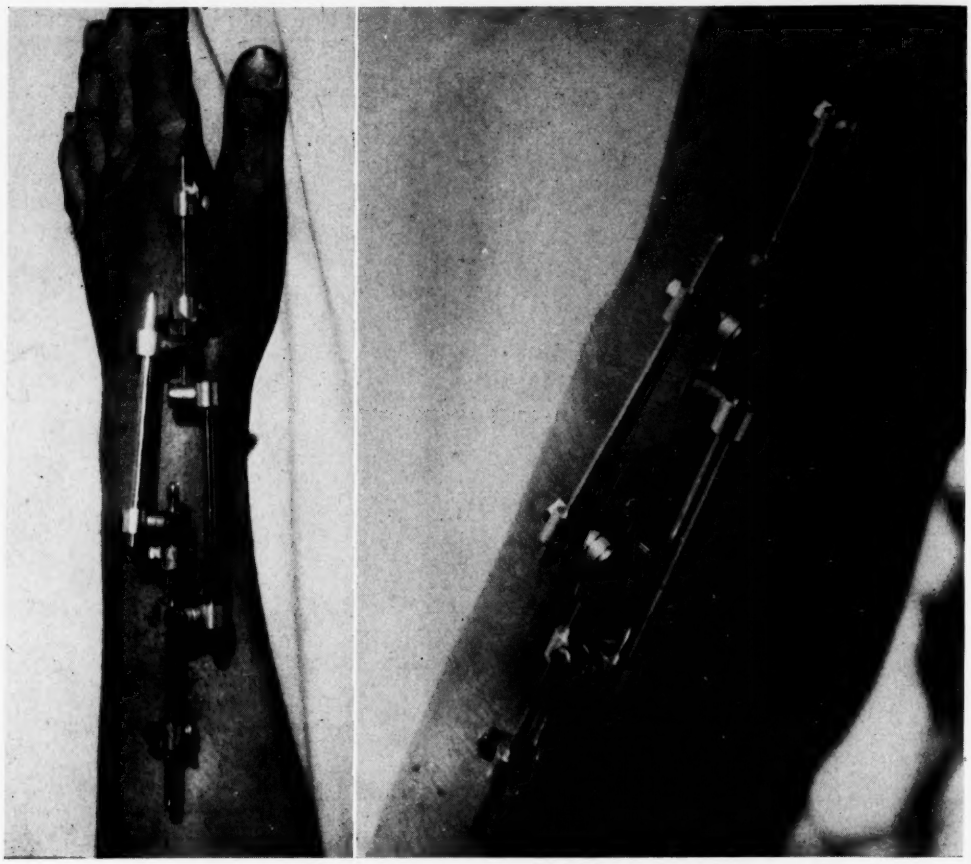


Fig. 3.—Wrist with dual pins and double bars in place.

The next case is that of a woman who reached into an automatic washer which was in full-spinning motion. The wet clothes enveloped her fingers. The clockwise motion of the spinner evulsed the hand at the wrist, compounding the forearm at the ulnar styloid (Fig. 6, *A* and *B*). The distal end of the ulna was projected forward 1½ inches (3.7 cm.) and came to lie over the carpal bones. Through this torsion the radius sustained a spiral fracture 2½ inches (6.2 cm.) long above the articulation of the wrist. The ulnar styloid is visible between the distal end of the radius and the ulnar shaft. The triangular ligament between the radius and ulna and the annular ligament was evulsed. The fracture was reduced by the traction and countertraction method and the ligaments were sutured. Normal relations between the radius and ulna, the ulnar styloid and shaft, and the radial fragments was established. Dual pins in the proximal and distal radial fragments with external bar fixation completed the procedure (Fig. 6, *C* and *D*).

A fracture of both bones of the distal third of the forearm with complete dislocation of the fragments is shown in Figure 7. Here, traction through the wrist

Fig. 4.—Roentgenograms of similar fracture treated with through-and-through metacarpal pin.

TABLE 1.—*Seventy-One Cases of Fracture of the Upper Third of the Radius**

No.	Age			Sex		Hosp. Days			Duration of Fixation			Anes.		
	Aver.	Oldest	Youngest	M	F	Aver.	Least	Most	Aver.	Least	Most	Pent. Sod.	Local	E & E
1	14	14	14	1	...	2	2	2	31	31	31	1	0	0

*Supplementary treatment, diathermy and massage; complications, none; average final rating of results, anatomic *B*, functional *A* and economic *A*.

TABLE 2.—*Fractures of the Middle Third of the Radius and Ulna**

No.	Age			Sex		Hosp. Days			Duration of Fixation			Anes.		
	Aver.	Oldest	Youngest	M	F	Aver.	Least	Most	Aver.	Least	Most	Pent. Sod.	Local	E & E
4	30.5	51	9	2	2	7.2	5	11	40	33	46	3	0	1

*Supplementary treatment: casts, 2; diathermy and massage, 1. Complications: 2 positive Kahn reactions; exploration 1 contracture of palmar fascia in presence of syphilis. Average final rating: anatomic, 2*A* and 2*B*; functional, 2*A*, 1*B* and 1*C*; economic, 2*A*, 1*B* and 1*C*.

TABLE 3.—*Fractures of the Lower Third of the Radius and Ulna**

No.	Age			Sex		Hosp. Days			Duration of Fixation			Anes.		
	Aver.	Oldest	Youngest	M	F	Aver.	Least	Most	Aver.	Least	Most	Pent. Sod.	Local	E & E
12	29.9	82	4	7	5	1.2	0	3	44	21	72	12	0	0

*Supplementary treatment: diathermy and massage, 5; ASE bandage, 1. Complications: traumatic neurocirculatory disturbance, with loss of reduction following premature removal of pins, 1; pin seepage and pin infection, 1. Average final rating: anatomic, 9*A*, 2*B* and 1*C*; functional, 11*A* and 1*C*; economic, 11*A* and 1*C*.

TABLE 4.—*Colles Fracture**

No.	Age			Sex		Hosp. Days			Duration of Fixation			Anes.		
	Aver.	Oldest	Youngest	M	F	Aver.	Most	Least	Aver.	Most	Least	Pent. Sod.	Local	E & E
54	51	89	6	21	33	3.9	73	0	41.2	69	20	51	3	0

*Supplementary treatment: application of splint, 1; diathermy and massage, 30. Complications: pin drainage, 6; chemical dermatitis, 1; positive Kahn reactions, 2; pin seepage and pin infection, 1; ischemic paralysis due to previously applied cast (present when pinned), 1. Average final rating: anatomic, 49*A*, 4*B*, and 1*C*; functional, 50*A*, 2*B* and 2*C*; economic, 52*A* and 2*B*.

joint with fixation through the metacarpal bone of the thumb was used, and countertraction with pins in the radius alone was proximal to the fracture.

Fig. 8*A* shows dual pin and external bar fixation of a fracture in the middle third of both the radius and the ulna. In this case the ulna was reduced and fixed first, as previously described. Traction was directed down the ulnar shaft during reduction. By shifting the scale on the chain, traction was moved to the radial side. Then the radius was reduced and fixed.

Fig. 8*B* shows a fracture at the junction of the upper and middle third of the radius. Reduction was obtained, as in the other cases, by traction and counter-

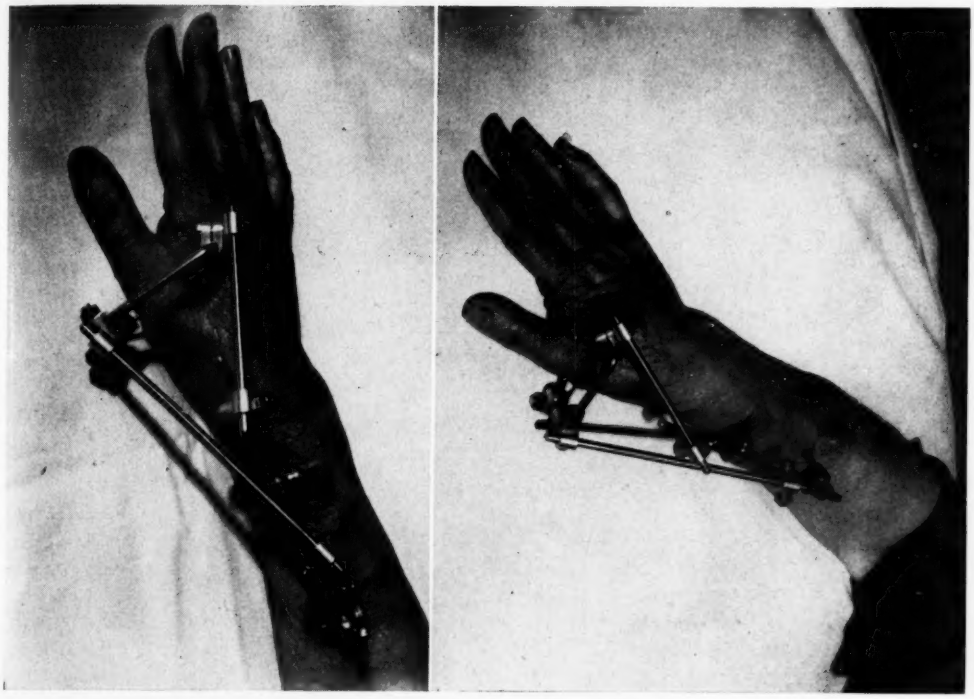


Fig. 5.—Photographs of wrist of same patient, with apparatus in place.

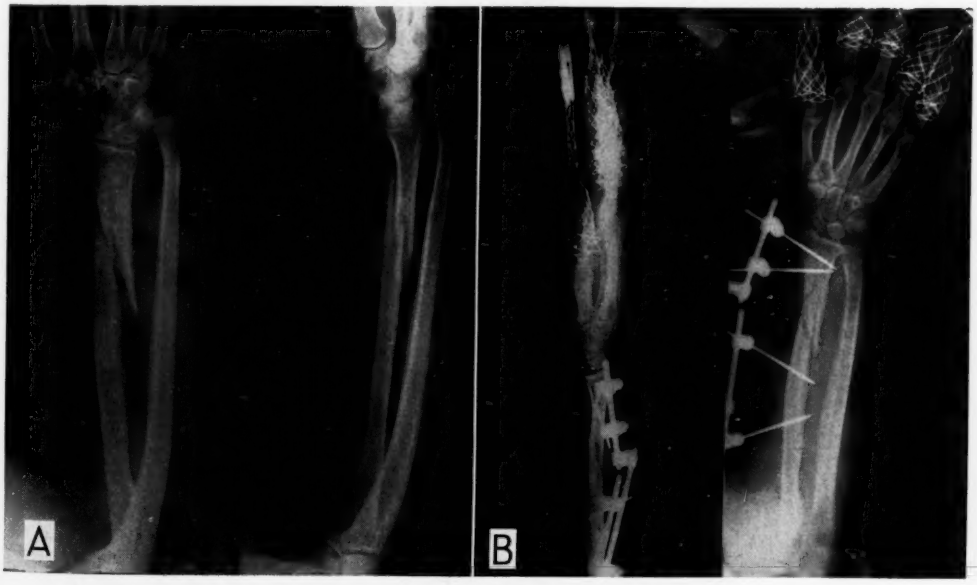


Fig. 6.—Fracture due to injury in an automatic washing machine (see text).

traction, with the line of traction through the center of the shaft. Maintenance of reduction was accomplished with dual pins and external bars (Fig. 8*C*).

End Results.—In this series of 71 cases the patients who were available were examined at the end of one year. Those who could not come in for examination were asked to report by letter. The results were classified as *A*, *B*, and *C*, with the following percentage rating: *A*, 87.5 to 100 per cent; *B*, 62.5 to 87.5 per cent, and *C*, 0 to 62.5 per cent.

A denotes anatomic rating, and the total was arrived at after considering length, alignment, apposition and angulation. *B* denotes functional rating. This was obtained by considering the following points: (1) total subjective functional result (as given by the patient); (2) total objective functional result; (3) joint movement above the fracture as compared to the other side, and (4) joint movement below the fracture as compared to the other side. *C* denotes economic rating, with consideration given to the following factors: 1. Same work as before, lighter or heavier. 2. Same pay as before, more or less. 3. Same hours of work, more or less. 4. Same volume of work, more or less.

A statistical report on the 71 cases is given in the accompanying tables.

In treating one fracture of the upper third of the radius (Table 1), a 14-year-old boy was hospitalized for two days and fixation maintained for thirty-one days. We prefer to use a general anesthetic, in order to obtain as much muscle relaxation as possible. Diathermy and massage were used. The rating on this case is *B-A-A*. The anatomic rating *B* was used because of less than 87.5 per cent approximation of the fractured fragments.

There were 4 patients with fractures of the middle third of the radius and ulna. Their average age was 30.5 years. The average stay in the hospital was seven and two-tenths days. A general anesthetic was used in all cases. The duration of fixation averaged forty days. Light casts were applied to prevent bowing in 2 instances. One patient had physiotherapy. Two patients with positive serologic reactions were given antisyphilitic treatment. In 1 patient a claw hand developed; the forearm was explored to check for interposition of the nerves between the fractured fragments, but none were found. In this group, anatomically, there were 2 cases rated *A* and 2 rated *B;* functionally, 2 were rated *A*, 1 *B* and 1 *C*. The economic rating was *A* in 2, *B* in 1 and *C* in 1 (Table 2).

Twelve patients had fractures of the lower third of the radius and ulna (Table 3). The average age was 29.9 years and the average hospital stay was one and one-half days. Pentothal sodium was used for anesthesia in all cases.

In considering the complications, 1 patient, aged 75, had a neurocirculatory disturbance and active osteoarthritis with a high sedimentation rate. The pins and external bars were removed early to facilitate hydrotherapy, which caused loss of some reduction. The patient's interpretation of her results is *A* functionally and economically; our rating, however, is *B-C-C*. In 1 case there was slight seepage around the pin and infection, but healing was complete in one week. The final ratings in this group are, anatomic, 9 *A*, 2 *B* and 1 *C;* functional, 11 *A* and 1 *C;* economic, 11 *A* and *1* C.

There were 54 cases of Colles' fracture. This fracture is common to all ages and to both sexes. It requires little or no hospitalization. The average age was 51, the oldest 89 and the youngest 6 years. The average hospital stay was three and nine-tenths days; 1 patient had other serious injuries and was in the hospital for seventy-three days. An average of forty-one and two-tenths days of fixation was necessary for visible callus formation. Fifty-five per cent of the patients required physiotherapy, and about 20 per cent had complications. One patient had ischemic paralysis, present when pinning and skeletal fixation were done, which was due to a previously applied cast. One pa-

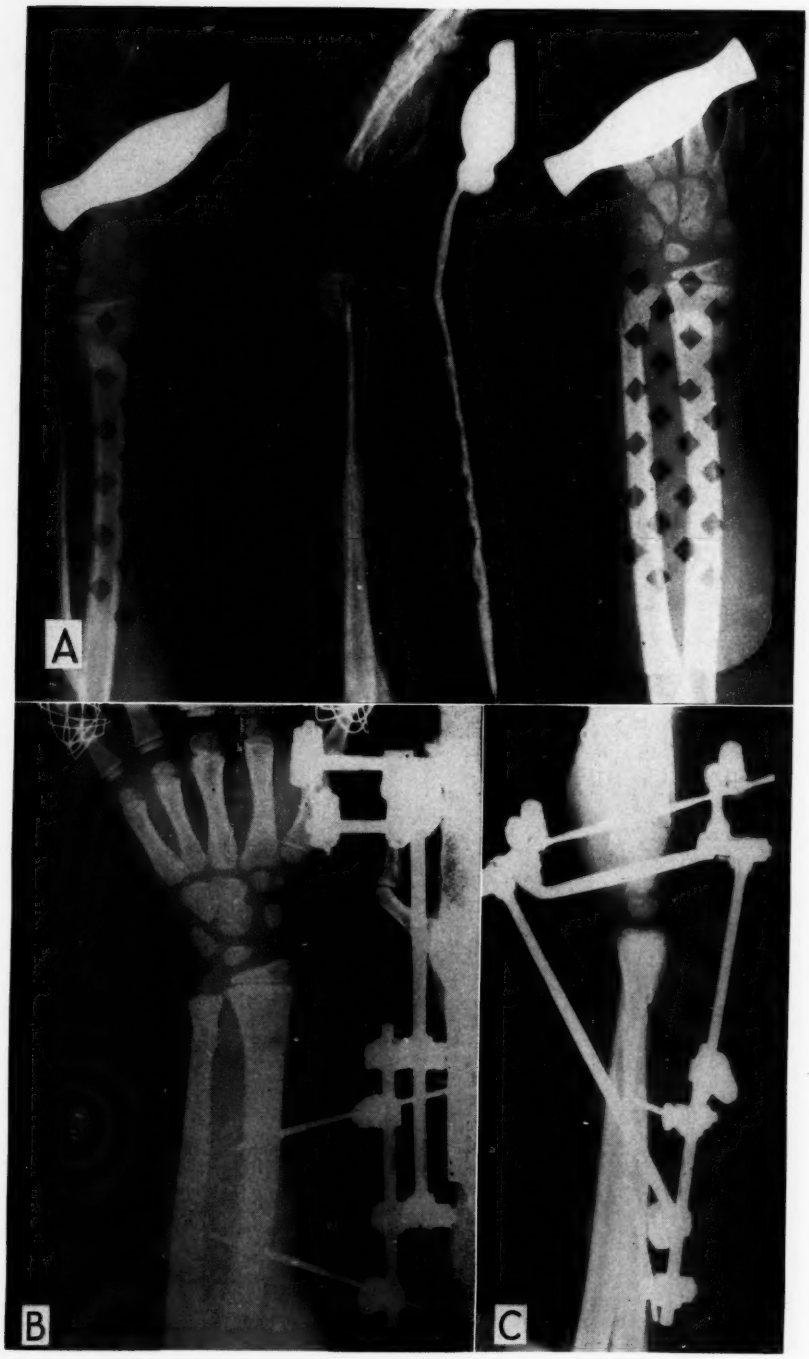


Fig. 7.—Fracture of both bones of distal third of forearm.

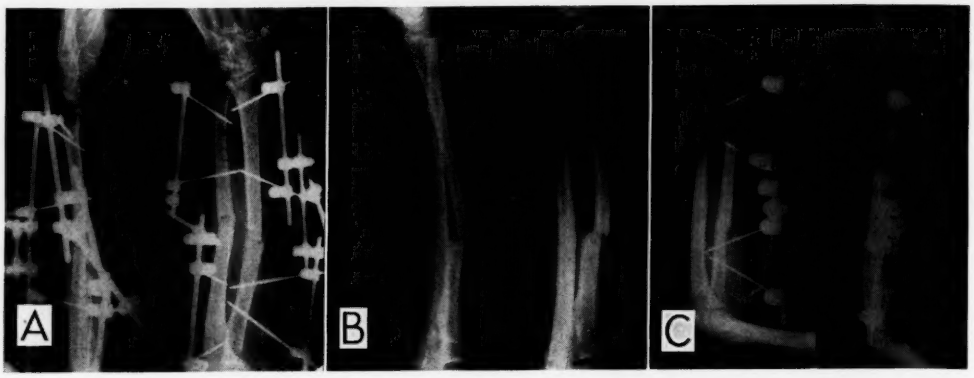


Fig. 8.—Dual pin and external bar fixation of fracture of middle third of both radius and ulna.

tient had a chemical dermatitis. One patient had pin seepage and infection. Six patients had pin drainage. Two patients had positive Kahn reactions. There were 80 per cent excellent results, 15 per cent good results, and 5 per cent poor results (Table 4).

RÉSUMÉ

On rapporte un procédé simple et précis pour la réduction des fractures de l'avant-bras. On se sert d'appareil de traction et de contention, de clous et d'une barre extérieure de fixation. L'auteur se réjouit de ses résultats.

ZUSAMMENFASSUNG

Es wird eine einfache Technik zur Einrichtung von Unterarmbruechen beschrieben. Das Verfahren bedient sich des Zuges und Gegenzuges, eines Doppelstifts aund aeusserer Fixierung mittels einer Stange. Durch die Anwendung der Methode haben sich die Resultate der Verfasser erheblich gebessert.

SUMÁRIO

Uma tecnica simples e positiva para redução de fraturas do ante-braço é apresentada. O método utiliza a tração e a contra-tração, pinos duplos e barra de fixação externa. Os resultados finais do autôr têm sido grandemente melhorados pelo seu uso.

RESUMEN

Se presenta una técnica sencilla y positiva para la reducción de fracturas del antebrazo. Se emplean tracción y contra-extensión, dos clavos y fijasión externa on harra. Ha mejorado grandemente los resultados de los autores.

RIASSUNTO

E' presentata una semplice e sicura tecnica di riduzione di fratture dell'avambraccio. Il metodo fa uso di estensione e contro-estensione, di un doppio chiodo e di una barra esterna di fissaggio. I risultati finali dell'Autore sono stati grandemente migliorati dall'uso di tale metodo.

BIBLIOGRAPHY

Anderson, R., and O'Neill, G.: Surg., Gynec. and Obst. 78:434-440, 1944.
Baker, L. D., and Schaubel, H. J.: North Carolina M. J. 7:457, 1946.
Bosworth, B. N.: Surg., Gynec. and Obst. 72: 667, 1941.
Bradford, C., and Wilson, P. D.: Surg., Gynec. and Obst. 75:408, 1942.
Conzett, D. C.: J. Iowa State M. Soc. 36:282, 1946.
Dwyer, F. J., and Murry, D. H.: Northwest Med. 45:173, 1946.
Goodwin, F. C., and Cameron, D. M.: Surg., Gynec. and Obst. 75:343-344, 1942.
Johnson, W., Malstrom, B. E., and Behrents, E. G.: Industrial Med. 15:685-688, 1946.
Thorndike, A. Jr., and Dimmler, C. L. Jr.: New Eng. J. of Med. 225:475, 1941.
Weir, L. D.: J. Kansas M. Soc. 50:60, 1949.
Whiston, G.: Rocky Mountain M. J. 42:833, 1945.

Stellate Ganglion Block in Treatment of Acute Subdeltoid Bursitis

EVERETT J. GORDON, M.D., F.A.C.S., F.I.C.S.
WASHINGTON, D. C.

ACUTE subdeltoid (subacromial) bursitis is often severely incapacitating, with intense pain and discomfort. The patient may request emergency orthopedic care to secure immediate relief of the distress and disability, often of two to six weeks' duration, with resultant economic loss.

Methods and means of treatment now generally in use—diathermy, infra-red baking, roentgen therapy, moist warm packs, liniments, procaine infiltration, needling and aspiration—do not produce prompt, lasting relief but usually require an extended period of therapy (several weeks) before the extremity returns to normal function. Needling and aspiration are often effective means of evacuating calcareous deposits, but there is often considerable local soreness and discomfort for three or four days afterward. Excision of the bursa is, of course, an excellent method of treatment, but it involves hospitalization and increased expense and loss of time.

The use of parasympathetic nerve block in treatment of neurovascular diseases and injuries of both upper and lower limbs has steadily increased in recent years. Impetus was given by extensive experience in World War II, when numerous surgeons were forced to learn the procedures in order to save limbs after severe vascular injury. In addition, stellate ganglion block is being used in the relief of angina pectoris, causalgia or reflex sympathetic dystrophy of the upper extremity, and—quite spectacularly of late—in the emergency treatment of cerebral vascular occlusions and thromboses.[1]

The use of stellate block for subacromial bursitis and other painful conditions of the upper extremities is not new. De Sousa Pereira[2] in 1945, followed by Caldwell, Broderick and Rose[3] in 1946, reported encouraging results in the management of significant numbers of cases. However, there has been little general acceptance of this technic, probably owing to lack of familiarity and resultant apprehension. In Caldwell's series of 18 cases of acute subdeltoid bursitis treated solely with stellate ganglion blocks, there were 83.3 per cent excellent and 16.7 per cent good results. Fifty per cent of patients obtained considerable relief after only a single block, and all were relieved by one or two additional blocks at intervals of one to seven days. Less striking relief was reported in cases of the chronic condition.

The results in the 36 cases of acute subdeltoid bursitis herein reported closely parallel those of Caldwell's series: 88.9 per cent of the patients were completely well within seven days; 4, or 11.1 per cent, were much improved in the same period and completely relieved in an additional two weeks, after a few physical therapy treatments following their return to work. Stellate blocks were employed as a therapeutic adjunct in the management of 10 cases of chronic subdeltoid bursitis, in some of which adhesive capsulitis was present, the results were also favorable and encouraging, although less dramatic than those obtained in the "acute cases." Discomfort was definitely alleviated, and shoulder motion was more quickly restored than is generally observed after physical therapy alone.

Rationale.—The intense pain and limited shoulder motion associated with acute subdeltoid bursitis arise from the swollen, edematous bursal sac plus exudate in the bursa and the tendinous shoulder cuff.

Submitted for publication June 14, 1951.

These impinge under the acromion process with rotation, elevation or depression of the shoulder and result in stimulation of the abundant sensory nerve endings in this area. The local swelling and exudation result from persistent constriction of the arteriolar bed and prolonged or intense vasoconstriction of the venocapillary bed, leading to dilatation and stasis, followed by diapedesis of plasma or cellular elements. A reflex arc is established, in which nerve impulses from a region of tissue injury produce reflex constriction of precapillary sphincters, "shunting" of blood through arteriovenous capillaries and arteriovenous anastomoses, and collapse of the true capillaries. The vasospasm gives rise to tissue anoxia, resulting in increased capillary permeability and transudation of excessive amounts of fluids through the capillaries to produce edema. The paralyzed capillary bed fails to respond to direct stimuli; this is similar to the anoxic permeability and diapedesis of blood elements in the sludging of blood in patients with frostbite, malaria, etc.

The ganglion block breaks the reflex arc which produced constriction of the precapillary sphincters and thereby interrupts the venocapillary paralysis, stasis and diapedesis. The more nearly normal flow of blood through the true capillaries and the consequent increase in lymph flow relieves edema and pain and explains the prompt symptomatic relief usually observed after stellate block. Although in the large majority of cases there are dense calcareous deposits which undoubtedly have been accumulating asymptomatically for many months, acute symptoms are not manifested until there is a superimposed inflammation of the soft tissues, perhaps from unnoticed minor trauma, such as a bump on the shoulder, strain while lifting or stretching overhead in a closet, etc. The role of infection is vague and probably overemphasized. As there appears to be no change in the roentgenographic appearance of these calcium deposits for several weeks after all symptoms have cleared and as, in some cases, no such degeneration is present, it is my opinion that this cannot be the exciting or principal cause of the intense pain and restricted motion accompanying acute subdeltoid bursitis. Rather than direct the primary therapeutic attack at removal of the calcium deposit, it appears more rational to induce intense vasodilation and increased oxygenation and lymph flow to the affected tissues, and thereby evacuate the transudates and exudates which appear to be the immediate cause of disability. The calcareous deposits are slowly absorbed in a period of several months to a year—possibly aided by the improved local circulation, although the exact pathomechanism is not clear.

Technic of Injection.—There are several approaches to injection of the stellate ganglion. The effect is identical no matter which technic is employed, but it is of course important to learn and adopt the one method which is easiest and safest in the hands of the individual operator. This particular problem has prevented general use of this valuable procedure; the technic herein described and advocated, therefore, will be explained in detail.

Anatomic Features.—The stellate ganglion is formed by the fusion of the inferior cervical and first dorsal sympathetic ganglia and lies on the anterolateral surface of the bodies of the seventh cervical and the first thoracic vertebrae, between the head of the first rib and the vertebral artery. Frequently it is 2.5 cm. long, but it varies considerably in size. The cervical sympathetic trunk above the ganglion lies on the deep fascia covering the longissimi capitus and colli muscles, which is continuous with the fascia anterior to the scalenus anticus muscle. In the same plane, but laterally, lies the phrenic nerve; anteriorly is observed the carotid sheath (internal jugular vein, vagus nerve and carotid artery) and inferiorly, the dome of the pleura, which extends above the clavicle anteriorly and to the lower edge of the first rib posteriorly.

It is highly desirable to block not only the stellate ganglion but the intermediate

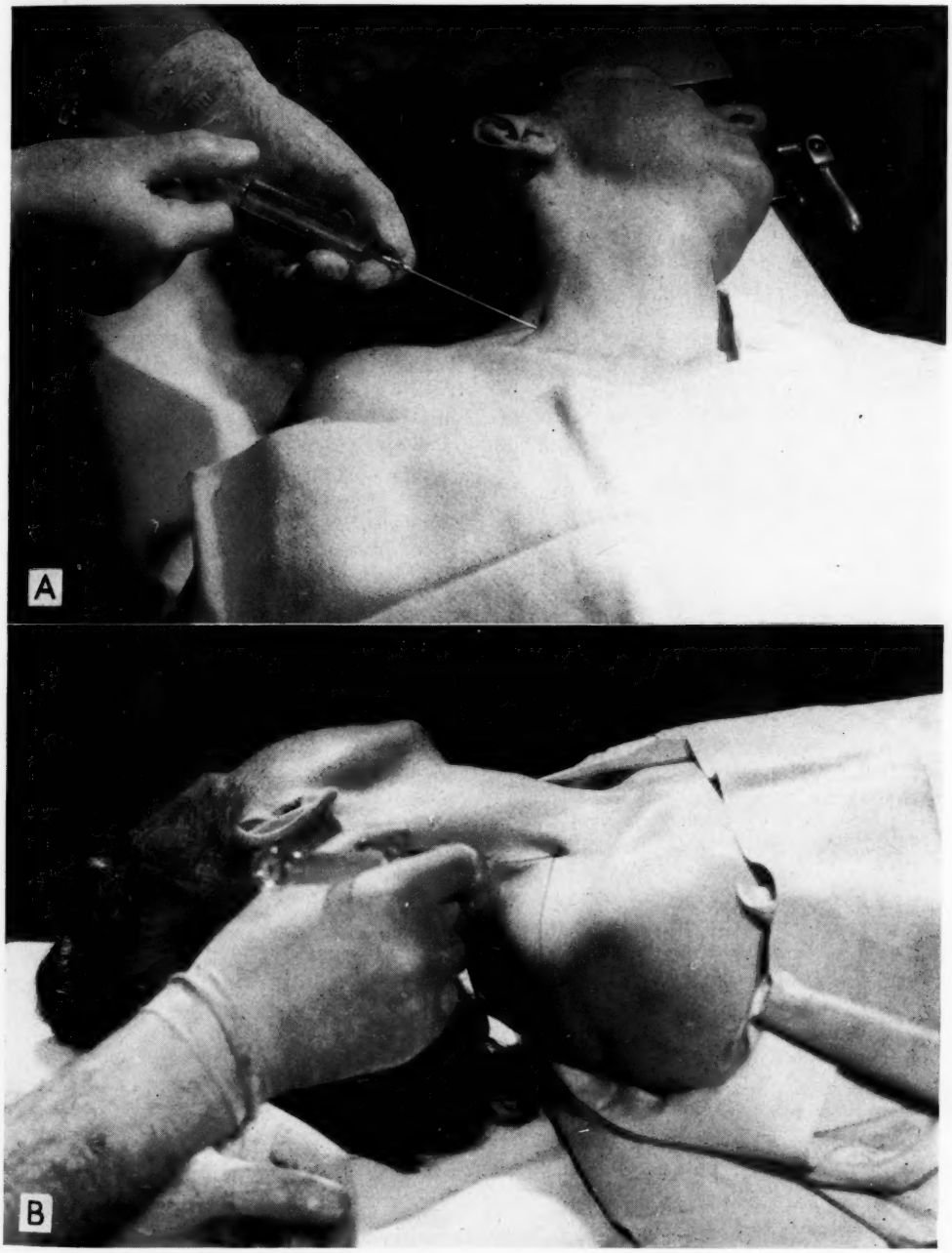


Fig. 1.—*A*, position of needle in relation to clavicle and posterior border of sternocleidomastoid muscle and external jugular vein. *B*, position of patient for injection and direction of needle. Note pillow under shoulders and head turned to opposite side.

and middle cervical ganglia which lie superiorly between the sixth and seventh cervical vertebra and contribute postganglionic neurons to the upper extremity. De Sousa Pereira has demonstrated that a block of this entire anatomic and physiologic group achieves complete interruption of the vasomotor and afferent pathways and results in the most intense vasomotor effect in the upper extremity and the thorax.

Thus, it is apparent that the optimum method is not one directed at the lowermost segment, the stellate ganglion, but one that will block all three ganglia in a single injection. Early workers attempted the difficult and dangerous anterior approach, beginning just above the clavicle and pointing the needle toward the head of the first rib in an attempt to block the stellate ganglion directly. Leriche and Fontaine adopted this technic in 1934, after the posterior approach advocated by Labat in 1924 (and later by Mandl and White[2]) was deemed unsatisfactory because of occasional contact with the pleural cavity as the needle passed between the parietal pleura and the body of the first thoracic vertebra.

The supraclavicular approach was later modified by Ochsner and DeBakey, Volpitto and Risteen, and others, in an effort to reduce the painful discomfort and frequent vasomotor, neurologic and pleuropulmonary complications that often made patients reluctant to submit to repeated blocks.[2]

The best method appears to be one in which the anesthetic solution is injected above, in the region of the sixth cervical level or the disc between the sixth and the seventh, and then allowed to infiltrate downward by gravity, through the fascial planes and along the sympathetic trunk to the lowermost stellate ganglion, thus blocking the entire group with one injection. The middle cervical ganglion is immediately blocked, as it lies in the area of the direct injection on the body of the 6; the solution then descends through the prevertebral aponeurosis, in which the cervical sympathetic chain is located, into the soft cellular tissues surrounding the vertebral artery and then into the intermediate and stellate ganglia. Properly done, this method is considerably safer and technically less difficult than the direct injection, and, in addition, the position of the middle cervical and stellate ganglia has a fairly constant relation to the sixth cervical vertebra. An injection just below the sixth cervical level will probably diffuse upward sufficiently from the force of the injection to reach the middle cervical ganglion, and then gravitate through the same fascial plane.

Anterolateral Approach (Murphey).— In the beginning of this series, injections were performed by both the anterior approach of De Sousa Pereira and the anterolateral method of Murphey.[4] It was quickly noted that patients complained of choking from the finger pressure required to displace the carotid sheath in the anterior technic, and also that unsuccessful blocks occasionally occurred. Therefore, the anterolateral technic of Murphey was used in most cases, as it was found to be more effective, less uncomfortable, and technically as easy as the other method. A successful block was obtained in every case, although in a few it was necessary to make a second injection of 5 additional cc. of procaine hydrochloride; this was easily accomplished without discomfort, as the area was already anesthetized.

Briefly, this method consists of placing the patient in the supine position, with the head turned to the opposite side and the neck hyperextended by a small firm pillow under the shoulders. The site of injection is determined by palpating the posterior border of the clavicular head of the sternocleidomastoid muscle, just posterior to the external jugular vein, which crosses the lateral edge of the scalenus anticus muscle at the level of the cricoid cartilage (C-6). The scalenus anticus and medius muscles will be palpated deeply here as a triangular interval. A skin wheal is raised, and then a 22 gauge, 2½ to 3 inch (6.2 to 7.6 cm.) needle is directed medially, posteriorly and infer-

iorly at an angle of 15 to 20 degrees, procaine hydrochloride being injected as the needle penetrates. If the patient complains of sharp, shooting pains in the arm or hand, the needle is too far posterior and is striking the lower branches of the brachial plexus; in this region it also may pierce either the vertebral or the inferior thyroid artery, as is revealed by a bloody aspiration. Should either occur, one merely withdraws the needle 1 or 2 cm. and directs it more anteriorly, passing over the transverse process and finally lodging firmly against the body of the sixth or seventh cervical vertebra or the intervertebral cartilage, at a depth of 3.5 to 6.0 cm., varying with the thickness and length of the neck. Firm resistance is noted as the needle strikes the anterolateral surface of the body of the vertebra, demonstrated by rotating the syringe and needle. Occasionally, if the patient has a short neck, the needle lodges on the body of the first thoracic vertebra, but the higher injection is safer and preferable. Should the needle pass medially to its full depth without striking bone, it is anterior to the body, and the angle must be corrected posteriorly. Usually this causes no serious difficulty other than discomfort or a swallowing sensation in the throat, or pain in the posterior neck or scapular region from irritation of the prevertebral fascia. Neither a bloody aspiration nor an anterior penetration should ordinarily interrupt the procedure.

Before injecting, one withdraws the needle sufficiently to free the tip from the periosteum. Precautionary measures are then taken: 1. Aspirate for blood or spinal fluid, to avoid a fatal subarachnoid injection (often without warning pain). 2. Have the patient inspire deeply with the syringe detached to watch for a sucking effect due to penetration of the pleura. A further safety procedure is the initial injection of only 1 cc. followed by observation for thirty seconds to note any unfavorable response. If none occurs, 6 to 10 cc. is injected, the needle being withdrawn slightly with the last few cubic

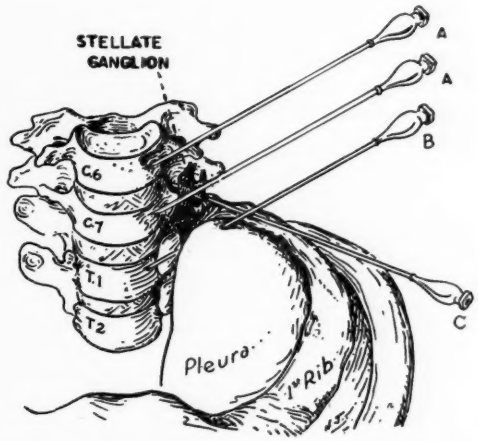


Fig. 2.—Anterolateral approach to stellate ganglion block. *A*, needle correctly inserted against anterolateral surface of body of sixth or seventh cervical vertebrae, or disc between C-6-7. Skin puncture made well above clavicle, needle angled 15 to 20 degrees inferiorly and posteriorly, avoiding dome of pleura. *B*, needle directed caudally in an unnecessary search for first rib. This may puncture pleura, with resultant pneumothorax, or lung, with resultant hemop tysis or massive collapse. *C*, needle directed cephalad, with danger of piercing dural cuff or nerve roots or entering intervertebral foramen and puncturing subarachnoid space or spinal cord. This may be painless but can be fatal. (*Adapted from Gilbert and de Takats, by permission.*)

centimeters in order to place the fluid in the proper fascial plane. Then the patient is immediately brought to the sitting position and the site is gently massaged downward.

The solution used was usually 2 per cent procaine hydrochloride, although several patients were treated with 2 per cent metycaine, procaine with epinephrine, and 0.15 per cent pontocaine with 2 per cent procaine in an effort to secure a more prolonged blocking effect. It was thought that, if the immediate effect of procaine were combined with the sustained (four to five hours) effect of pontocaine, the number of injections required could be diminished, but little difference was noted in the final results with and without pontocaine. Although there was no reduction in the number of blocks required to effect com-

plete relief of symptoms, there was a definite lengthening of each block and relief of pain lasted longer than with procaine alone.

In most cases nembutal or seconal (gr. ¾) was given three quarters of an hour before the injection, to reduce anxiety and as a prophylaxis against toxic reactions to procaine.

A successful block is manifested by early conjunctival congestion and Horner's syndrome—ptosis of the upper lid, narrowing of palpebral fissure and slight elevation of the lower lid, miosis, and anhidrosis of the face and forehead. Subjective and objective warmth and redness of the forearm, hand and shoulder soon follow. These signs may appear almost as soon as the patient becomes erect, or (more commonly) within three to ten minutes. If there are no ocular changes within ten minutes the injection should be repeated, with a slight change in the direction of the needle. Some vasomotor changes may occur even without an accompanying Horner's syndrome, owing to the blocking of the middle and intermediate cervical ganglia without blocking of the stellate ganglion; this is due to insufficient diffusion of the anesthetic. Often it results in an increased range of active and passive motion and relief of pain, but it is less effective than complete block.

The technic originally employed consisted of two or three blocks at intervals of one to three days, but this has recently been modified to repetition of the block at twenty-four hour intervals for a total of three blocks. Only rarely has a fourth block been required to clear mild residual symptoms, and this usually is administered forty-eight hours after the third injection. In no case have more than four blocks been performed, and only 3 patients have required this number.

Complications.—There were no serious complications in this series, but several minor reactions were occasionally observed. These included: (1) transitory pain with piercing of the prevertebral fascia; (2) temporary paresis of the upper extremity from extension of the anesthesia to the lower brachial plexus and (3) procaine reaction. With regard to the complication last mentioned, there was an intensely nervous and hysterical type of reaction which subsided within a few minutes, possibly from a partial intra-arterial injection; a second injection the following day was without incident. Vertigo, or a sort of "drunken" sensation, is not uncommon for fifteen to thirty minutes after the injection, possibly owing to the resultant temporary imbalance of the autonomic nervous system and to cerebral vasodilation. Stiffness or soreness at the site of injection (perhaps from a mild hematoma) may occasionally occur but is easily relieved by warm moist packs.

More serious complications have been observed by other surgeons but can be avoided by strict adherence to routine precautions. Among these are (1) pneumothorax and hydrothorax; (2) subarachnoid injection, and (3) anesthesia of the phrenic nerve with unilateral diaphragmatic paralysis. In some of the older anterior technics the needle was directed caudally in an unnecessary search for the first rib, with resultant puncture of the pleura or the lung and pneumothorax, massive collapse of the lung or hemoptysis. If the needle is directed cephalad it may well enter the intervertebral fora-

Fig. 3.—Roentgenograms (retouched for clarity) of actual injection with needle in *situ*. *A*, Injection against body of C-6. Full Horner's syndrome produced in two minutes after patient allowed to sit up. *B*, injection against body of C-7. Horner's syndrome within two minutes. *C*, injection against body of T-1. Immediate Horner's syndrome. Injection more dangerous at this level than at C-6. More rapid onset of block is of no particular advantage. Injection at level of C-6 or C-7 is preferable. Solution descends by gravity and diffusion to level of stellate ganglion. Block of intermediate and middle cervical ganglia also obtained by higher injection, resulting in more intense vasomotor effect to upper extremity.

A
B
C

men and puncture the cord, or the dural cuff about the nerve roots—such an injection could be fatal! Bilateral blocks should never be done, because of the danger of phrenic nerve paralysis.

Thus, stellate ganglion block has potential dangers, especially in a large hospital service with numerous operating surgeons of varying experience. They can be minimized by accurate placement of the point of the needle, testing for pleural penetration by deep inspiration, and a small test injection; frequent aspirations should always be a routine part of the injection technic. The injections can be done as an outpatient service but should always be performed in a hospital or clinic where emergency resuscitation measures are available.

Results.—Immediately after the stellate ganglion is blocked, the involved arm can be slowly raised, passively, without great discomfort, through a surprising range of abduction and external rotation and a lesser arc of internal rotation. A common observation is an increase in motion from almost 0 to 90 degrees of abduction, 45 to 60 degrees of external rotation, and 15 to 20 degrees of internal rotation. Sometimes there is still a sharp pain or "catch" with lowering of the arm, as the inflamed bursa impinges under the acromion process. This immediate improvement is most dramatic in cases of the most severe involvement, with swelling, local tenderness, redness, and restricted motion. The patients in such cases are usually amazed at their newly found ability to raise the extremity without excruciating pain, although timidity and defensive muscle spasm may still be exhibited.

Current statistics show considerable variation in the range of motion and degree of relief from pain secured after each successive block. Some patients evinced 75 to 90 per cent relief from the very first block; others responded to this extent only after a second injection. Generally there was pronounced relief of pain, with somewhat less marked increase in range of motion. Internal rotation was usually the last shoulder motion to regain its full range, occasionally requiring a few stretching exercises. Subacromial tenderness and a "catching" sensation were the last signs to disappear in most cases.

Patients with a history of previous shoulder pain or definite episodes of bursitis, with or without treatment, generally responded more slowly to stellate block therapy and required additional physical therapy—infra-red treatments or diathermy, massage, over-head stretching, and pendulum exercises to promote internal and external rotation.

Ten chronically involved patients were treated with stellate blocks with definite improvement, less pain, more comfort in the involved shoulder, and facilitated motion. In their cases the procedure was a therapeutic adjunct rather than specific as in the "acute cases."

Although this is admittedly not a large series and consists solely of private patients without benefit of a large ward or clinic service, the distribution of male patients in a 2.1 ratio, concentrated in the third and fourth decades of life, conforms with the accepted statistics. This incidence lends some credence to the commonly accepted etiologic role of trauma. Further evidence of degenerative influences, often associated with trauma, is the presence of calcareous deposits in 85 per cent of the cases studied. However, few patients recall any specific injury, so that the trauma, if it be the precipitating agent, is probably in the form of repeated, mild, unrecognized blows or strains.

Throughout the series it was repeatedly observed that the most dramatic results were secured in the patients who were seen earliest after onset of their first shoulder symptoms. Such patients required less therapy and recovered with least loss of time from regular duties.

In only 2 cases of mild involvement were the patients treated by stellate block, as these patients do not usually come to the attention of an orthopedist, nor do they ordinarily require anything beyond a few

*Relief of Pain and Restoration of Shoulder Motion**

	Interval After Beginning Therapy	Patients Number of Cases Responsive 25%	50%	75%	100%
Mild (2)	24 hours	.....	1	.....	1
	48 hours	.....	.....	1	1
	72 hours	.....	.....	.....	2
	1 week	.....	.....	.....	2
Moderate (15)	24 hours	8	4	2	1
	48 hours	1	6	5	3
	72 hours	1	0	8	6
	1 week	.....	.....	2	13
Severe (19)	24 hours	2	14	3	0
	48 hours	.....	3	16	0
	72 hours	.....	1	12	6
	1 week	.....	.....	2	17
Composite	24 hours	10	19	5	2
	48 hours	1	9	22	4
	72 hours	1	1	20	14
	1 week	.....	.....	4	32

*All estimates by author based on recorded degrees of motion, tenderness and swelling, subjective and objective estimates of pain by doctor and patient.

physical therapy treatments. One was completely relieved within twenty-four hours by a single injection, and the other in seventy-two hours by two blocks.

In the cases of moderate involvement progress was more rapid after a second block in twenty-four hours. Within seventy-two hours 40 per cent were completely well, and 86.6 per cent were restored to normal function in one week, leaving only 2 patients (13.4 per cent) with mild restriction of motion or slight pain. In the majority of cases only two blocks were required.

The immediate relief of pain was more dramatic in patients with the severe conditions, possibly owing to the more striking contrast. Seventeen, or 89.4 per cent, had only mild residual evidence of pain and restricted motion after forty-eight hours (usually three stellate blocks), and 6, or 31.5 per cent, had a normally functioning shoulder after seventy-two hours. After one week this percentage had risen to 17 of 19 patients (89.4 per cent) back to normal, only 2 patients (10.6 per cent) having mild residual discomfort. Three stellate blocks were generally required for those in whom the condition was severe.

Thus, excellent results were secured in 32 cases, or 88.9 per cent; in only 4 cases (11.1 per cent) of the total series of 36 acute cases did the patients not have complete relief of all symptoms and signs within seven days of the beginning of stellate block therapy. In all 4 a few physical therapy treatments, such as diathermy or infra-red, massage, and stretching exercises completely alleviated all symptoms within an additional two-week period,

during which time all had returned to their regular employment.

Twenty-five cases have been followed for periods of one to four years. There have been no recurrences in the severe group but in the moderate classification there were mild recurrences of shoulder pain and muscle spasm in 2 cases, one seven months after treatment and the other one year later. Both promptly responded to a single physical therapy treatment.

Eighteen patients returned for roentgen examination after intervals of six to eighteen months; in 16, or 88.8 per cent, all (or all but a minute fleck in 3) of the calcium deposit was absorbed; in only 2 cases was the calcareous deposit unchanged (both in periods of eight to nine months), but in neither case had there been a recurrence of symptoms. Although absorption of calcareous deposits is known to occur spontaneously or after local needling and aspiration, the high correlation present in this series would appear to be significant.

COMMENT

Acute subdeltoid or subacromial bursitis, with or without calcareous tendinitis or peritendinitis, is a painful and incapacitating disorder of rather frequent incidence in the third and fourth decades of life. It is more common in the male, in the ratio of 2:1. The exact cause cannot always be well established, although minor unrecognized trauma is believed to be a prime factor. The intense pain, discomfort and limited shoulder motion result from local swelling and exudation following prolonged and intense vasoconstriction, dilatation and stasis of the venocapillary bed, with secondary diapedesis of cellular and plasma elements and persistent arteriolar constriction. Shoulder joint motion is limited by impingement of the swollen, inflamed, sensitive soft tissues of the subacromial bursa (and perhaps the tendinous shoulder cuff) against the acromion process as the arm is raised, rotated or lowered.

Stellate ganglion blocks serve to interrupt this severe cycle of vasospasm, exudation and pain by producing intense localized vasodilation and subsequent absorption of the painful exudate. As the effect of the block gradually diminishes, the vasoconstriction partially recurs, absorption is interrupted, and probably more exudation follows, resulting in further pain and discomfort. With each subsequent block there is progressively less tendency to return of the vasoconstriction and vasodilatory effect is the more sustained. A constant confirmatory observation was that the patient with the warmest reactions in the shoulder had the maximum relief of symptoms.

The beneficial results observed with other forms of therapy, such as roentgen rays, diathermy, infra-red rays, procaine injection and needling, are undoubtedly due to the production of local hyperemia and consequent similar absorption of exudate and edema. However, block of the stellate ganglion produces much more prompt and more intensive hyperemia than does any one of these agents; this may well explain the more dramatic and sustained relief obtained, with resultant return to normal function within an average period of less than five days, as contrasted to periods of two to six weeks with other forms of therapy.

The technic employed in most of this series was the anterolateral approach of Murphey, which yielded successful blocks in every case with a minimum of difficulty and risk. The true anterior technic of De Sousa Pereira was successfully used but proved less satisfactory in our hands than the anterolateral approach. The older supraclavicular methods are much more dangerous and should not be employed. The posterior technic, somewhat similar to that employed for the lumbar parasympathetic block, is also effective and fairly safe. The results are identical once a successful block has been established, so that the actual technic employed is a matter of personal preference and familiarity. However, maximum vasomotor effects are

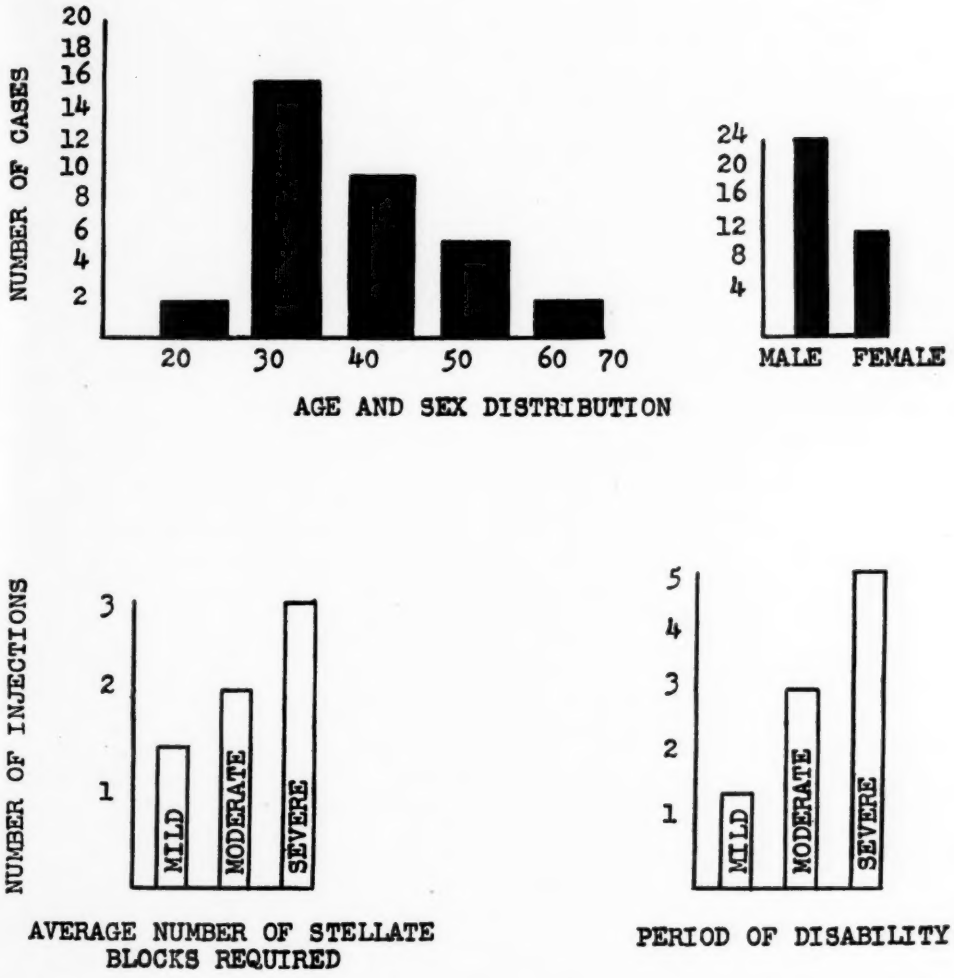


Fig. 4.—Analysis of 36 cases of stellate ganglion black. The period of disability (until complete restoration of normal function) varied with the patients' occupations, employer or employee capacity; partial duties performed earlier. Age is recorded in years and disability period in days.

Duration of Symptoms			Degree of Involvement*			Calcerous Deposits*		
Max.	Min.	Av.	Mild	Mod.	Severe	Yes	No	?
21 da.	8 hr.	5 da.	22	15	19	29	5	2

*Classified by degrees of pain, tenderness, local heat, swelling, limitation of motion. In 3 cases of severe involvement it was necessary to perform four blocks each.

*Detected by roentgen examination. In 2 cases (listed in final column above) no roentgenograms were available.

produced if the middle and intermediate cervical ganglia are included in the stellate ganglion block.

There were no serious complications in this series. The only untoward effects noted were a procaine reaction, transitory cervical and scapular pain from piercing of the prevertebral fascia, and occasional numbness of the arm from partial block of the brachial plexus. Pneumothorax, hydrothorax, air embolism, fatal subarachnoid injection, phrenic nerve paralysis with limited diaphragmatic motion, and cardiorespiratory paralysis from a vagal inhibitory reflex may occur unless proper precautions are constantly exercised. These include careful direction of the needle and deep inspiration to observe for sucking effect, and a 1-cc. trial injection, with a waiting period of thirty seconds prior to the complete injection. The injection should never be lightly regarded or performed in the clinic or office unless proper resuscitation equipment is available.

The results of stellate ganglion block are most striking in cases of acute severe involvement of recent onset; immediate, dramatic relief of pain is obtained, and there is an increase in active and passive shoulder motion. Although a mild relapse may occur when the effect of the block has disappeared, further improvement is secured by additional blocks at intervals of one or two days until normal function is completely restored. In the two "mild" cases, one or two blocks were required to restore completely normal function within seventy-two hours; in 15 cases in the "moderate" group an average of two blocks produced excellent results in 40 per cent within 2 hours and in 86.6 per cent within one week, and in 19 cases in the "severe" group an average of three blocks restored normal function in 89.4 per cent within one week. In the latter group 6 patients, or 31.5 per cent, had a normally functioning arm seventy-two hours after beginning therapy for a severely disabling and painful shoulder.

Thus, there were excellent results in 32 cases, or 88.9 per cent; in 4 cases, or 11.1 per cent of those in which the patients were not completely well within one week, a few physical therapy treatments given after return to work cleared the residual symptoms. The average periods of disability were one and one-half days in the "mild" cases; three and two-tenths days in the "moderate" group, and five and five-hundreths days in the "severe."

Calcareous deposits were detectable by roentgen examination in 29 of 34 cases studied. After an interval of six to eighteen months there was marked or complete absorption of calcium in 16, or 88.8 per cent, of 18 in which the patients were available for follow-up roentgen studies.

A total of 25 patients were followed for one to four years; there were only 2 mild recurrences, seven and twelve months later, but both promptly cleared with one physical therapy treatment.

The use of an oral vasodilator drug was tried in 2 cases, but the results were not encouraging. Perhaps intra-arterial injection would be more effective, but stellate block is a simpler procedure. A supraclavicular sensory nerve block to interrupt the afferent half of the reflex arc is reported to be of value, but it has not been attempted here.

As experience was gained it was observed that occasionally a fourth block would promptly clear up any mild residual symptoms, so that it was unnecessary to resort to one or two weeks of physical therapy. After the first block, with subsequent relief of pain, patients are generally less apprehensive and more receptive to further injections. The mild preoperative sedative given prior to the first block was usually not necessary for subsequent injections.

SUMMARY AND CONCLUSIONS

1. Stellate ganglion block is offered as a quick means of restoring normal function to the painful shoulder when the pain occurs as a result of acute subdeltoid bursitis or calcareous peritendinitis.

2. Discomfort, pain, disability and economic loss are materially diminished by this method of treatment as contrasted with other available forms of therapy.

3. The operative risk and the danger of serious complications are small if proper technic and safety precautions are observed. The anterolateral approach of Murphey gave consistently good results and is recommended for maximum vasomotor effect in the upper extremity.

4. Injections should be performed only after adequate instruction and supervision.

RÉSUMÉ ET CONCLUSIONS

1. On pratique le bloquage du ganglion stellaire en vue de redinner à une douloureuse sa fonction normale lorsque la douleur est conséquence d'une bursite aigue de la bourse sous-deltoidienne ou d'une péritendinite calcifiée.

2. En comparaison avec les autres formes de thérapie cette méthode est une mesure plus économique, moins douloureuse et qui laisse moins de gêne dans le mouvement.

3. Le risque opératoire et le danger de complications sérieuses sont très petits pourvu que l'on prenne toutes lesprécautions et une bonne technique. La voie d'abord antéro-latérale de Murphey donne constamment de bons résultats et est recommandée pour donner le maximum d'effet vasomoteurs au membre supérieur.

4. On ne devrait pas faire d'injection sans une stricte surveillance et une connaissance adéquate.

RESUMEN Y CONCLUSIONES

1. Se propone el bloqueo del ganglio estelar para restaurar rápidamente la función normal en el hombro doloroso, cuando el dolor ocurre como resultado de bursitis subdeltoidea o peritendinitis calcárea.

2. Desconsuelo, dolor, incapacidad y pérdida económica disminuyen materialmente por este método de tratamiento en contraste con otras formas de conducta terapéutica.

3. El riesgo operatorio y el peligro de complicaciones serias son pequeños si se obseran la técnica apropiada y precauciones de seguridad. La vía anterolateral de Murphey da resultados consistentemente buenos y se recomienda para efecto vasomotor máximo en la extremidad superior.

4. Las inyecciones deben hacerse sólo después de instrucción y supervisión adecuadas.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

1. Die Blockierung des Ganglion stellatum wird als Mittel zur raschen Wiederherstellung der normalen Funktion der schmerzhaften Schulter vorgeschlagen in Faellen, wo der Schmerz durch eine akute subdeltoide Schleimbeutelentzuendung oder durch eine verkalkende Peritendinitis hervorgerufen wird.

2. Im Gegensatz zu anderen verfuegbaren Behandlungsarten werden durch diese Methode der Schmerz, die Bewegungsbehinderung und die oekonomischen Opfer der Kranken erheblich gemindert.

3. Das Risiko der Operation und die Gefahren ernster Komplikationen sind gering, wenn eine saubere Technik und sorgfaeltige Vorsichtsmassnahmen zur Anwendung kommen. Der anterolaterale Zugangsweg nach Murphey ergab staendig gute Resultate und wird zur Erreichung bester vasomotorischer Wirkungen auf die obere Extremitaet empfohlen.

4. Die Einspritzungen sollten nur nach ausreichendem Training und unter strenger Aufsicht ausgefuehrt werden.

RIASSUNTO E CONCLUSIONI

1. Il blocco del ganglio stallato e' presentato come un rapido mezzo per ripristinare la normale funzionalita' in una soalla dolente per borsite acuta sottodeltoidea a peritendinite calcificante.

2. Disconforto, dolore, inabilita' e danno economico sono materialmente diminuiti con detto trattamento, il che non si verifica cona altra forma di terapia.

3. Rischio operatorio ed altre complicazioni sono esigue se la tecnica e' appro-

priata e le precauzioni osservate.

4. La via di accesso antero-laterale di Murphey e' la raccomandata per ottenere i massimi effetti vasomotori all'estremita' superiore.

5. Le infiltrazioni dovrebbero essere praticate soltanto dopo adeguato tirocinio e supervisione.

SUMÁRIO E CONCLUSÒES

1. O bloqueio do ganglio estrelado é apresentado como um meio de restaurar rapidamente as funções normais de um ombro dolorôso quando a dôr ocórre como resultado de uma bursite sub-deltoidiana ou de uma peritendinite calcarea.

2. Desconfôrto, dôr, inhabilidade e pêrda economica são materialmente diminuidos por este método de tratamento em contraste com outras formas de terapeutica disponivel.

3. O risco operatório e o perigo de sérias complicações são pequenos, si uma técnica apropriada e precauções de segurança são observadas. A abordagem antero-lateral de Murphey tem dado consistentemente bons resultados e é recomendada, visando o efeito vasomotôr maximo na extremidade superior.

4. As injeções devem ser executadas somente depois de adequada instrução e supervisão.

REFERENCES

1. Gilbert, N. C., and de Takats, G.: Emergency Treatment of Apoplexy, J.A.M.A. 136: 659-65, 1948. Searles, P. W., and Nowill, W. K.: Cerebral Vascular Accidents, Southern M. J. 43: 229-34, 1950.

2. DeSousa, Pereira, A.: Blocking of the Middle Cervical and Stellate Ganglion with Descending and Infiltration Anesthesia, Arch. Surg. 50: 152-165, 1945.

3. Caldwell, Guy A., Broderick, T. F. Jr., and Rose, R. M.: Sympathetic Block of Stellate Ganglion—Its application in orthopedic conditions. J. Bone & Joint Surg. 28: 513-52, 1946.

4. Murphey, D. R. Jr.: Stellate Ganglion Block —A new Anterior Approach, Ann. Surg. 120: 759-763, 1944.

5. Pollin, I. M., and Deutsch, E. V.: Death Following Stellate Ganglion Block, Ann. Surg. 133: 226-33, 1951.

LA PRESSE MEDICALE

La Grand Journal Français de Chirurgie et de Medicine parait chaque semaine, et donne toutes les informations scientifiques et professionelles

ABONNEMENT

$11.00 par an.

Priére d'envoyer directement le montant de l'abonnement à:

LA PRESSE MEDICALE, Masson et Cie, éditeurs

120 Boulevard St. Germain Paris VI, France

Surgical Treatment of Abdominal Ascites Due to Cirrhosis of the Liver

Preliminary Experience with New Cannula Button in Peritoneosaphenous Anastomosis

CHARLES F. SCHNEE, M.D., C.M., A.I.C.S.
PATCHOGUE, NEW YORK

IN such a disease complex as abdominal ascites due to cirrhosis it is doubtful that there can ever be a well defined criterion for operability, leading to assurance of a reasonably good prognosis. As a consequence, many operations have been performed for conditions of long standing, when the pathologic process is irreversible and when other complicating factors mark the case as a grave operative risk. The results, as might have been expected, were discouraging. Surgical intervention for the relief of abdominal ascites and as a method of treatment for cirrhosis of the liver is condemned by internists and given only passing consideration by surgeons who value their reputation. However, examination of the case histories upon which this paper is based reveals that only those patients who had hopelessly failed to respond to medical therapy were considered by the medical service, which received all such admissions, to be suitable candidates for operation. This, in my opinion, partially explains the results obtained by surgical intervention. The first patient upon whom we performed a peritoneosaphenous anastomosis using a vitallium anastomotic cannula button was relieved of his ascites. He died, however, and autopsy revealed cirrhosis of the liver, bilateral polycystic kidneys, extensive infarction of the spleen, thrombosis of the splenic vein and inferior vena cava with recanalization of the caval thrombus, chronic duodenal ulcer, chronic cholecystitis and acute extensive pulmonary edema. This patient was transferred to the surgical department from a group of patients under the care of Dr. Arthur J. Patek Jr. at Goldwater Memorial Hospital. The medical record had previously shown a nonprotein nitrogen level of 150 mg. per hundred cubic centimeters and a urea nitrogen level of 45 mg., and the patient had completely failed to respond to the dietary regime for cirrhosis of the liver. The patient survived the implantation of the cannula button by two months and five days. Considering observations at autopsy, the fact that this patient survived operation has always been a matter of amazement to me. Although his case was extraordinarily atypical, it should serve as a warning to any surgeon when a patient with abdominal ascites eventually reaches him. It is the type of case that should be unequivocally rejected for surgical intervention. Nevertheless, it did demonstrate that ascites may be relieved by surgical means.

There is clinical and laboratory evidence that the return of the ascitic fluid to the general circulation is of benefit in restoring liver function. However, in those cases in which the condition has advanced to a stage of extensive fibrotic replacement of the liver, the return of the ascitic fluid is no longer of value; surgical intervention only adds to the patient's discomfort and may give rise to troublesome complications.

The surgeon who attempts to relieve ascites and indirectly to treat cirrhosis

From the Coldwater Memorial Hospital, Third Surgical Division and City Hospital, service of Dr. Frederic W. Bancroft and Dr. Willis Weeden.
Submitted for publication May 2, 1951.

should have a comprehensive knowledge of the disease and the surgical procedures devised in the past for this purpose.

The time-honored procedure for relief of abdominal ascites is paracentesis. It was noted prior to 1896 that after repeated paracenteses recovery occasionally took place. Recovery was attributed to adhesions forming between the abdominal wall and the intra-abdominal viscera. Through these adhesions, it was reasoned, increased circulation was effected and the ascites subsided. It was on the basis of this reasoning that operations for the relief of abdominal ascites were first devised.

In 1896, Drummond suggested omentopexy. Later, in 1898, Morison and Talma devised and advocated a procedure known as the Morison-Talma operation for ascites. This consisted of an omentopexy or epiplopexy. It simply consisted of laying the abdomen open and suturing the omentum to the parietal peritoneum. The operation today has fallen into ill repute, although, in reviewing statistical material gathered in the early days of this procedure, one is surprised by the results reported. In the *American Journal of Surgery* for June 1909, the statistics on omentopexy and its modifications in a series of 1,565 cases were reported. The article claimed that 30.4 per cent of the patients were cured, 19.8 per cent relieved, and 39.2 per cent not relieved; 10.6 per cent died. Maiochi, during this same period, reported the cases of 17 patients operated on without a death. Some of the cases were observed for five years, and 4 patients seemed to be cured of their symptoms. These early statistics speak much more favorably for surgical treatment than do those of the present time. It should be recalled that in the late nineteenth century and the beginning of this century the present enthusiasm about cirrhosis from a medical point of view had not yet developed, and a great many of the cases reported by surgeons during this period were undoubtedly encountered at an early stage. The statistics, therefore, may reflect this factor.

Another method was that of Schiassi. This consisted of making a flap in the upper left abdominal quadrant down to the peritoneum and a vertical incision through the peritoneum, withdrawing the spleen and omentum into the wound and fixing these in a subcutaneous position.

A third method, devised by the Mayos, consists of forming pockets beneath the posterior sheath of the rectus muscle. Incisions are made over the upper part of the rectus through the peritoneum. The second incision is made below this, and a pocket is formed by tunnelling upward. The omentum is drawn down into this pocket and sutured in place. This may be done on both sides of the abdomen.

Narath in 1905 modified several of the aforementioned procedures. His incision was made to the left of the round ligament; the omentum was brought through an opening in the peritoneum into a subcutaneous pocket, and the peritoneum only closed loosely around the pedicle of the omentum.

Corson (*Annals of Surgery*, 1907) wrote an enthusiastic article advocating Narath's method. Binni also praised this modification of omentopexy, on the basis that it not only established permanent and efficient drainage of the ascitic fluid into subcutaneous tissue by means of a herniated omentum, but also established collateral circulation. Up to this time surgeons had attributed the relief of ascites in cases of cirrhosis of the liver to the establishment of a collateral circulation from the portal system to the general systemic circulation. If this were so, it was reasoned, why would it not be advisable to establish a direct circulatory anastomosis between the mesenteric system of veins and the inferior vena cava? The experiments of Eck had demonstrated that anastomosis in animals could be successfully performed between the portal vein and the inferior vena cava; therefore it was suggested that the same be done in man. Vidal was the first to carry out the Eck principle. Guibe, comment-

ing upon the procedure, stated, "The operation ought to be abandoned because however efficient it may be, it exposes the patient to great danger—the danger of alimentary intoxication, which might possibly be foreseen and avoided, but especially the danger of a general infection of intestinal origin, since the intestinal mucosa does not always pose a sufficient barrier to microbic invasion." Vidal's patient died after four months, with evident signs of a sudden general infection. Thierry de Martel carried out a like procedure, and his patient died of anuria within forty-eight hours. The Eck fistula idea has been revived and improved by Blakemore and Lord. Success by this means is difficult to evaluate; however, I have examined several patients so treated who were doing well after several years.

Lambotte and Handley devised drainage of the ascitic fluid by inserting thick silk suture material leading from the peritoneal cavity through the subcutaneous tissues. Henschen in 1913 conceived the idea of bringing the fluid into a subcutaneous area by means of an open finger cot sutured in place and leading into the subcutaneous tissues.

Paterson, in the *Lancet* of Oct. 29, 1910, first introduced the use of the glass button. This button was a spool-like affair much the same as the Cooney button, except that it lacked the guard at one end which protected the opening from being closed by herniation of omentum or bowel. It led from the peritoneal cavity to the subcutaneous fat layer; however, no mention was made by Paterson of the formation of a subcutaneous pocket. The button evidently fell into disuse for two reasons: Its inner opening was blocked either by omentum or by intestine, and its outer opening was directly against the subcutaneous tissues with no preformed pocket formation so that fluid resorption might take place.

A new approach to the surgical treatment of ascites was devised by Routte and described in *Lyon Chirurgica*, March 1910, and *La Presse Medicale*, June 1910.

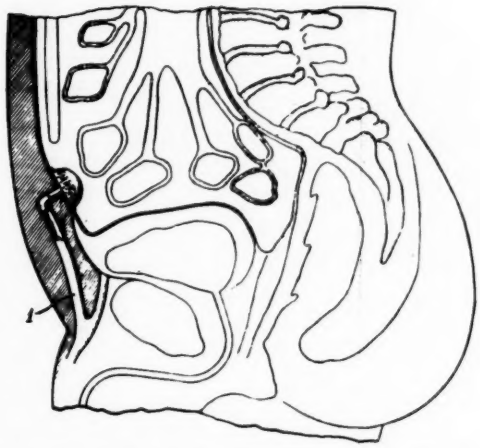


Fig. 1.—Sectional view with cannula button in position in peritoneal cavity. Cannula stem of button enters reflected and transplanted great saphenous vein (*1*). Ascitic fluid is thus returned to general circulation via femoral vein.

This consisted of a peritoneal saphenous anastomosis. The operation was first carried out in June 1907. Routte's method consisted of dissecting the great saphenous vein at the upper part of the thigh for a distance of approximately 7 to 9 inches (17.7 to 22.8 cm.). The vein was severed in the midthigh area and the distal end tied. The proximal portion of the vein was reflected and brought up through the subcutaneous tissues of the abdomen into the right lower quadrant or inguinal area. In this position anastomosis was carried out between the vein end and the peritoneum. The opening soon peritonealized and drainage through the saphenous vein into the common femoral stopped. Despite these physiologic handicaps, successful results in several cases were reported by different surgeons. The operation, however, was soon abandoned. This method of directly draining the ascitic fluid into the venous circulation was also attempted by Castle and Bryant of San Francisco in 1911. One of their patients died after the operation, and the other was followed up for several weeks only.

Saphenoperitoneal anastomosis was again reported by Bernheim of Johns Hopkins in the *American Journal of Medical Sciences* during 1915. Bernheim modified the Routte technic by anastomosing the side of the vein through an opening approximately 1 inch (2.5 cm.) long. His patient did well for approximately eight days, after which time he suddenly felt a pain in his left shoulder and died within twenty-four hours. Autopsy was not permitted, and the true cause of death was never determined. Bernheim concluded his article with the following statement: "It seems fair to conclude that the operation is worthy of further trial in suitable cases, since technically it is not difficult to carry out, and theoretically it has much to commend it." Others have reported using the Routte method of peritoneal saphenous anastomosis with varying success. The principal cause of doubt in evaluating the procedure lies in the follow-up. Some of the patients were followed for only short periods, and others were completely lost sight of.

This brief historical review of the surgical treatment of ascites brings us up to the present period. In 1937, Muriel K. Fuller first prescribed extensive resection of the small intestine in the treatment of ascites. The biophysiologic basis for this procedure is explained by four salient points:

1. The ascites is due to obstruction of the portal circulation. Removal of a part of the portal network by ample resection tends to decrease the venous return to the extent that what does come into the portal vein is capable of passing through the cirrhotic liver. Blood pressure is reduced in the portal vein and its capillaries, and the transudation of fluid into the peritoned cavity is halted or decreased.

2. The shortened intestine is carrying the same amount of fluid and food as before, and under such circumstances it is possible that the osmotic pressure of the intestinal contents will be increased, thus bringing fluid into the lumen and increasing the fluid content of the feces. This, it is held, explains the diarrhea following extensive resection.

3. The blood stasis of the portal system causes some anoxemia, which increases the osmotic permeability of vessel walls to fluid. With relief of this anoxemia due to improved portal circulation, the osmotic permeability is returned to a more nearly normal status.

4. The removal of several feet of small intestine changes the relation between the visceral peritoneum and the parietal peritoneum. Assuming that the fluid passes from the visceral peritoneum and is absorbed by the parietal peritoneum, resection of the intestine increases the ratio of the absorptive surface to the secretory surface.

Huergo, Castellanos and Nunez reported a case of ascites treated by resection in September 1942. They concluded by stating that the operative wound healed by first intention and that the patient was ambulatory in twelve days. His weight later increased to 140 pounds (63.5 Kg.), and there was no recurrence of ascites. The authors expressed the opinion that enterectomy is effective in the cure of ascites. (I may also state that, in personal communication with Dr. Donald Cook of Chicago, I was advised that he also had witnessed a case of ascites cured by enterectomy.)

During the last seven years, Blakemore and Lord have reported in a number of articles their method of treating ascites by anastomosing the portal vein into the inferior vena cava, using the Blakemore vitallium tube and cuff method. They have also attempted to reroute part of the portal circulation by removing one kidney and the spleen and anastomosing the splenic vein to the renal vein. The primary objection to these procedures is the extensive character of the operation to be carried out on patients who are, in many cases, unfavorable risks. Second, it has frequently been observed that the vessels to be anastomosed have undergone sclerotic change, which makes the anastomosis extremely difficult.

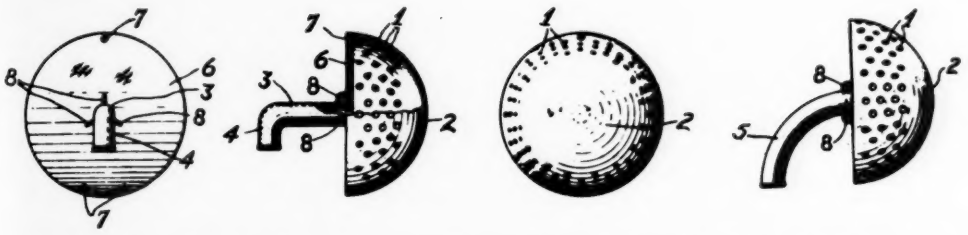


Fig. 2.—Different views of dome-shaped cannula anastomotic button with perforations (*1*) for fluid drainage and nonperforated area (*2*) to hold back viscera. Cannula part (*3, 4, 5*) may be of different shapes, right-angled or curved. The former is preferable. Note flat posterior surface (*6*), small perforations (*7*) for anchoring button to peritoneum and fascia to prevent rotation, and eyelets (*8*) for sutures to hold vein on cannula.

Other methods of treatment have since been reported by Parker and Breckler and by Lord, but they are modifications of methods previously devised.

The most discussed of the recently reported methods of treatment of ascites is that presented by Crosby and Cooney in the *New England Journal of Medicine* in 1946. They revised the old Paterson method of subcutaneous drainage of the fluid by use of a glass spool button. Their bibliography, however, failed to list Paterson's contribution published in the *Lancet* on October 29, 1910. The Paterson procedure was supplemented by the formation of a large subcutaneous pocket for the resorption of the fluid, and the inner side of the button was revised with the addition of an extending glass protective plate to prevent plugging of the button by omentum and intestine. I have used similar buttons except that they have been made of boilable lucite instead of glass. The advantages of this boilable lucite button lie in the fact that it is more easily handled and fear of breakage is eliminated.

Cooney in a personal communication to me stated that he and his associates had had 20 cases in which favorable results were obtained. Some of the patients in these cases, he stated, are entirely free of ascites, and others require less frequent taps than before the insertion of the button.

I have inserted "Paterson-Cooney" buttons in 6 patients. Five were failures. Four of these were used in cases of long-standing ascites with irreversible cirrhosis. The fifth patient did well for a time, but the pocket gradually became fibrotic and contracted to negligible size. In the sixth case the result was highly satisfactory. The necessity for periodic taps decreased and eventually paracentesis was no longer necessary. The albumin-globulin ratio, reversed before operation, returned to normal, and the general well-being of the patient was greatly improved. He was followed for three years, after which time he was still doing well. This result, together with favorable reports from others (Lord; Lane; Cooney) demonstrates that surgical intervention can be of assistance provided the surgeon receives the patient before the liver has reached the irreversible stage. The return of the protein in the ascitic fluid by one means or another, to the general circulation is beyond a doubt beneficial to a patient with ascites due to cirrhosis, and the practicability of returning the fluid by vein has been demonstrated by Carter and recently by Olvera.

Careful study of my cases and those of others demonstrates that when the albumin-globulin ratio returns to normal the patients do well. When this is impossible, as in the presence of far advanced pathologic change, failure may be anticipated. If the patient continues to do well it may be reasoned that it is due to favorable changes in the hepatic disease, since in

some instances accumulation of fluid stops. When pockets of fluid remain evident and tapping is unnecessary, as in one of my cases, improvement must have taken place in the liver, since hyalinization of the pockets must have occurred and fluid resorption reduced to a negligible amount. This further emphasizes the necessity of seeing patients before irreversible pathologic change has affected the liver. It further dictates better cooperation between medical and surgical services.

In the spring of 1944, aided by Dr. Frederic W. Bancroft, I undertook to study the Routte procedure of peritoneosaphenous anastomosis for the relief of abdominal ascites. In the presence of clear ascitic fluid it was known to be clinically safe and biophysiologically desirable to return the fluid to the general circulation. Considering the end results of transplanting the sectioned great saphenous vein and anastomosing it into the peritoneal cavity, it was reasoned that there were three possible causes for failure of the anastomosis to maintain itself: first, closure of the anastomosis by the peritoneum; second, the fact that an unfavorable disposition of the intestinal tract and the omentum against such an ostium is always a possibility, and third, the fact that occlusion of the vein by surrounding fibrotic tissue, especially where it passes through the fascial sheaths, is an ever-present threat to the success of the procedure.

To overcome these objections, I devised what I have called an anastomotic cannula button, manufactured of vitallium. The button was placed at the junction of the saphenous vein with the peritoneum. The inner or bulbous portion was so devised as to protect the ostium of the cannula from being occluded by omentum, and the cannula portion was attached with the idea of preventing occlusion of the vein by fibrotic formation about the vein as it passed through the fascial layers of the abdominal wall.

The operation should be carried out in two stages: first, transposition of the saphenous vein into the new subcutaneous bed, followed in ten days by implantation of the anastomotic cannula button. Another method that suggests itself is to return to the original Routte procedure, but use a Blakemore tube and effect the anastomosis between the vessel and peritoneum by the cuff ligature method described by Blakemore for the anastomosis of blood vessels. Such a procedure, in the absence of seepage of ascitic fluid about the vein transposition, might well be carried out in one stage.

I have met with varying degrees of success with the use of the cannula button and have experienced a number of failures, but no postoperative fatalities due to the drainage of ascitic fluid into the general circulation.

Certain conclusions, therefore, have been reached. The study and work suggest several questions which are unanswered in the literature and which may have an intimate bearing on the overall problem of cirrhosis of the liver.

SUMMARY AND CONCLUSIONS

1. The author points out that patients with abdominal ascites requiring surgical treatment should undergo reasonable clinical and laboratory tests before being accepted. In some cases, during the past decade, the condition has proved irreversible and operation has been performed as a last desperate resort, a situation in which failure is to be expected.

2. A brief review of surgical procedures related to the subject is presented.

3. The question is asked, "Is there an anatomic arterial factor in cases of cirrhosis which favors partial anoxia in the presence of certain gastrointestinal disturbances?" This is suggested by the fact that cirrhosis may develop in association with chronic congestive heart failure. Such a variation in the arterial pattern might well explain why cirrhosis is sometimes observed in the teetotaler while the worst inebriate may have a perfectly normal liver.

4. It is suggested that further study on the problem of the formation of ascitic fluid is necessary. Is it purely due to a

pathologic condition of the liver? Are the gastrointestinal tract and the peritoneum in some way involved?

5. Closer cooperation between the internist and the surgeon is emphasized as essential.

6. A revised method of performing the peritoneosaphenous anastomotic procedure of Routte is presented, with use of a new anastomotic cannula button, and an alternate operation is suggested and outlined in which the Blakemore blood vessel tube and cuff anastomosis are used.

RÉSUMÉ

1. Les patients faisant de l'ascite, chez qui un traitement chirurgical électif est indiqué, devraient toujours être soumis à des épreuves suffisantes de laboratoire et cliniques avant d'être choisis. Souvent, ces dernières années, l'opération était une tentative désespérée chez un malade dont la conditon était devenue irréversible. On explique facilement les pauvres résultats obtenus dans la majorité des cas.

2. On revoit brièvement les techniques chirurgicales en rapport avec le sujet.

3. Dans les cirrhoses, y a-t-il anatomiquement un facteur artériel hépatique qui favoriserait une anoxie partielle en présence de certains troubles gastro-intestinaux? On est amené à penser cela du fait qu'une cirrhose peut se développer en association avec une défaillance cardiaque chronique et congestive. Une telle variation dans la disposition artérielle pourrait bien expliquer pourquoi on rencontre parfois une cirrhose chez un abstinent et un foie parfaitement normal chez le pire ivrogne.

4. Une investigation plus poussée sur le problème de la formation de l'ascite est absolument nécessaire. Est-ce seulement du domaine de la pathologie hépatique? Le tractus gastro-intestinal et le péritoine sontils intéressés?

5. Il doit y avoir une coopération plus étroite entre le chirurgien et le médecin "interniste."

6. On présente une méthode revisée de pratiquer l'anastomose péritoinesaphène de Routte se servant d'une nouvelle "canule-bouton" pour anastomose. On suggère de décrit une opération où le tube pour vaisseaux sanguins et manchon pour anastomose de Blakemore sont employés.

ZUSAMMENFASSUNG

1. Kranke mit Bauchwassersucht, die einen elektiven chirurgischen Eingriff brauchen, sollen, ehe sie zur Operation zugelassen werden, einer ausreichenden klinischen und laboratoriumsmaessigen Untersuchung unterzogen werden. Waehrend der vergangenen Jahrzehnte hat sich die Erkrankung in manchen Faellen als irreparabel herausgestellt, und die Operation wurde nur als letzter Akt der Verzweiflung ausgefuehrt. Die unter solchem Umstaenden eintretenden unguenstigen Resultate in der Mehrzahl der chirurgischen Eingriffe beduerfen keiner weiteren Erklaerung.

2. Es wird ein kurzer Ueberblick ueber die bei der Erkrankung angewandten chirurgischen Verfahren gegeben.

3. Gibt es einen anatomischen Faktor in der arteriellen Versorgung der Leber, der in Faellen von Leberzirrhose beim Bestehen gewisser Magendarmstoerungen einer partiellen Sauerstoffarmut Vorschub leistet? Eine solche Moeglichkeit wird durch die Tatsache angedeutet, dass eine Zirrhose sich in Verbindung mit chronischer Herzschwaeche und Stauung entwickeln kann. Eine derartige Veraenderung der arteriellen Verteilung koennte sehr wohl eine Erklaerung dafuer abgeben, dass die Zirrhose manchmal bei Abstinenzlern beobachtet wird und andererseits eine durchaus normale Leber bei schweren Trinkern vorkommt.

4. Weitere Untersuchungen des Problems der Entstehung der Aszitesfluessigkeit sind notwendig. Entsteht die Bauchwassersucht einfach auf Grund krankhafter Veraenderungen der Leber? Spielen der Magendarmkanal und das Bauchfell irgend eine Rolle?

5. Engere Zusammenarbeit zwischen

Internisten und Chirurgen ist anzustreben.

6. Der Verfasser beschreibt eine Modifikation der Routteschen Methode der Anastomose zwischen B a u c h f e l l und Saphena, wobei ein neuer Knopf der Anastomosenkanuele zur Anwendung gelangt. Ausserdem schlaegt er eine zweite Operation zur Auswahl vor und beschreibt ihre Technik. Hier gelangen das Blakemoresche Blutgefaessrohr und eine Manschettenanastomose zur Anwendung.

RESUMEN

1. Pacientes con ascitis que requieren tratamiento quirúrgico electio deben someterse a preubas clínicas y de laboratorio adecuadas antes de ser aceptados. En algunos casos, durante la pasada década, el estado patológico ha sido irreversible y la operación ha tenido lugar como un recurso desesperado final. En tales circunstancias se explican ampliamente los resultados desfavorables en la mayoría de los fracasos quirúrgicos.

2. Se revisan someramente los procedimientos operatorios sobre el particular.

3. ¿Existe un factor arterial hepático anatómico en casos de cirrosis que favorezca anoxia parcial en presencia de ciertos trastornos gastrointestinales? Esto lo sugiere el hecho de que la cirrosis puede desarrollarse asociada con desfallecimiento cardíaco congestivo crónico. Dicha variación en el tipo arterial puede explicar bien porqué la cirrosis ocurre alguna vez en el abstemio y existe un hígado perfectamente normal en el borracho inveterado.

4. Se necesita un estudio más amplio sobre el problema de la formación del líquido ascítico. ¿Se trata puramente de un estado patológico hepático? ¿Se encuentran complicados en alguna forma el tubo gastrointestinal y el peritoneo?

5. Debe tener lugar la más estrecha cooperación entre el internista y el cirujano.

6. Se presenta un método revisado para efectuar la anastomosis peritoneosafena de Routee, con el uso de unnuevo botón cánula anastomótico, sugiriéndose una operación alternada y señalándose como usar el tubo vascular sanguíneo de Blakemore y la anastomosis en puño.

RIASSUNTO

1. I pazienti con ascite che richiedono trattamento chirurgico dovrebbero essere sottoposti ad un adeguato studio clinico e di laboratorio prima di essere avviati all'intervento. In alcuni casi durante la passara decade, la infermita' veniva considerata irreversibile e l'operazione veniva esequita come ultima risorsa. In queste circostanze la poverta' dei ristulati é spiegabile.

2. E' presentata una breve rivista dei procedimenti chirurgici in uso.

3. Esiste un fattore anatomico dell'arteria epatica in casi di cirrosi, fattore che favorisce un'anoxia parziale in presenza di certi disturbi gastrointestinali? Questa ipotesi é suggerita dal fatto che la cirrosi puo' svilupparsi in associazione con scompenso cardiaco cronico congestizio. Una tale anomalia nello sviluppo arterioso potrebbe ben spiegare perché la cirrosi é talvolta incontrata nell'astemio e invece un fegato perfetto é incontrato nel peggiore bevitore.

4. Ulteriore studio é necessario nella comprensione del problema dell'ascite. E' essa esclusivamente dovuta ad una condizione patologica del fegato? Sono implicati in qualche modo il tubo gastroenterico ed il peritoneo?

5. Una piu' vicona collaborazione fra internista e chirurgo é desiderabile.

6. Una modificazione del metodo di Routte dell'anastomosi peritone-safena é presentato, é suggerito l'uso di un nuovo bottone cannula ed é suggerita ed esposta un'operazione in cui un tipo di vaso sanguigno é usato per l'anastomosi. secondo Blakemore.

SUMÁRIO

1. Os pacientes de ascite abdominal escolhidos para tratamento cirurgico eletivo deveriam ser submetidos a exames

clinico e de laboratório razoaveis antes de serem aceitos. Em alguns casos durante a decada passada, o estado tem sido irreversivel e a operação tem sido executada como um ultimo esfôrço desesperado. Sob tais circunstancias os resultados desfavoraveis na maioria dos fracassos cirurgicos são amplamente explicados.

2. Uma bréve revista dos processos cirurgicos relacionados com o assunto é apresentada.

3. Haverá um fatôr hepatico arterial em casos de cirróse que favorêça a anóxia parcial em presença de certas perturbações gastro-intestinais? Isso é sugerido pelo fato de que a cirróse póde evoluir em associação com insuficiencia cronica congestiva do coração. Tal variação no tecido arterial poderia explicar porque a cirróse é algumas vezes vista no abstinente e um figado perfeitamente normal é encontrado no alcoolatra.

4. Ulterior estudo do problema da formação do liquido ascitico é necessário. E' ele puramente devido á condição patológica do figado? Estarão o tubo gastro-intestinal e o peritoneo de algum módo envolvidos?

5. Mais intima cooperação entre o clinico e o cirurgião deve ser empreendida.

6. E' apresentado um método da anastomóse peritonio-safenósa de Routte, revisto e com o uso de uma nóva canula anastómotica; uma operação alternada é sugerida e configurada, na qual o tubo de Blakemore para vasos sanguineos e a anastomóse em abotoadura são usados.

REFERENCES

Drummond, E.: Importance of Early Paracentesis in Ascites, Practitioner 35, 1.

Morison: The Operative Cure of Ascites Due to Cirrhosis of the Liver, Proc. Roy. Soc. Med. 37:60, 1911.

Paterson, P.: The Treatment of Ascites by Drainage Into the Subcutaneous Tissues of the Abdomen, Lancet 2:1273, 1910.

Cabot, R. C.: The Causes of Ascites. A Study of Five Thousand Cases, Am. J. M. Sc. 163:1-14, 1911.

Ball, Sir C.: Venovenostomy for Ascites, Brit. M. J. 2:1697, 1911.

Bernheim, B. M.: Saphenoperitoneal Anastomosis for Ascites, Am. J. M. Clin. 151:806-811, 1916.

Binnie, J. F.: The Surgical Treatment of Ascites, Interstate M. J. St. Louis, 19:338-342, 1912.

Routte: De l'abouchement des veines saphenes internes au peritoine abdominal, dans certeins cas d'ascite a reproduction, Lyon Chirurg. 3:336-344, 1910.

Travernier: Traitement chirurgical de l'ascite par l'operation de Routte et le drainage capillaire sous-cutane, Lyon Med. 116:1009-1015, 1911.

Wynter, W. E.: Cure of Ascites by Permanent Drainage Through the Femoral Ring, Proc. Roy. Soc. Med. 1:49-51, 1907 (Clinical Lecture).

Carter, H. S.: The Use of Ascitic Fluid for Nutritive and Other Purposes With Therapeutic Indications, Am. J. M. Sc. 163:241-253, 1911.

Krestowsky: Anastomosis of Superior Mesenteric Vein With Vena Cava, Paris Med. 1:511, 1927.

Castle: Venoperitonealostomy, J.A.M.A., Dec. 30, 1911.

Binnie, J. F.: Textbook on Surgery.

Pedotti, F.: A Suggestion for the Surgical Treatment of Ascites Caused by Occlusion of the Portal Vein, Schweiz. Med. Wchnschr. 652:3.

Lotheissen, G.: The Present Status of the Surgical Treatment of Ascites, Med. Klin. 34:264, 1938.

Wegner, E. S.: Congenital Chylous Ascites, Apparently Cured by Routte's Operation (Venous Peritoneal Anastomosis), Am. J. Dis. Child. 47:586, 1934.

Eliashovitch: The Operation of Routte in Abdominal Ascites, Vrachebnaia Gazeta 33:2429, 1929.

Kehrer, J. K. W.: Anastomosis of the Vena Saphena Magna With the Abdominal Cavity for Relief of Ascites, Zentrlblt. f. Chirurgie 53:1815, 1926.

Porta, S.: Peritoneosaphenous Anastomosis of Routte in the Treatment of Ascites Due to Hepatic Cirrhosis, Acad. d. fisiocrit. in Siena 3:567-582, 1911.

Huergo, M.; Castellanos U., and Nunez, A.: Enterectomy in the Treatment of Ascites Due to Cirrhosis, Rev. de Med. & Cirurg. de la Habana Sept. 30, 1942.

Crosby, R. C., and Cooney, E. A.: Surgical Treatment of Ascites, New England J. Med. 235: 581, 1946.

Vidal, M.: Traitement chirurgical des ascites, Presse med. 2:747, 1903.

Blakemore, A. H., and Lord, J. W. Jr.: A Non-Suture Method of Blood Vessel Anastomosis, J.A.M.A. Vol. 127:685-691 and 748-753, 1945.

Olvera, A. A.: Abdominovenous Direct Transfusion of Ascitic Fluid in Hepato-Splenic Cirrhosis (Abstract), J.A.M.A. April 26, 1947, p. 1317.

Parker and Breckler: Contribution to the Surgical Treatment of Ascites, J.A.M.A. 141:1091-1092, 1950.

Lord, J. W.: Modification of Crosby-Cooney Operation for Intratable Ascites Due to Cirrhosis of the Liver, J.A.M.A. 138:767-768, 1948.

Chalmers and Davidson: Hepatic Cirrhosis, J.A.M.A. 140:71, 1950 (Minor Notes).

Lane, J. D.: Glass Button Operation for Palliative Relief of Ascites, Military Surg. March 1948, 177.

Edema and Ascites Formation (Editorial), J.A.M.A. 132:1501, 1946.

Simplified Photography for the Surgeon

JOHN T. LLOYD, M.D.
BLUFFTON, INDIANA

THIS paper describes an apparatus to simplify clinical photography for the surgeon, and outlines its use.

Clinical photography is being used more and more as an adjunct to the practice of surgery.[1] Its greatest value is in teaching, particularly in the training of residents. The camera follows the patient's progress with a critical eye. Photographic museums present pathology in a colorful and tasteful manner.[2] Surgical papers are weak without illustrations.[3]

The surgeon finds use for photography at the operating table, where pathologic tissues and organs can be depicted with their original color and luster—for example, the typical appearance of a perforated ulcer when the abdomen is open, the extreme edema of pancreatitis, or the brilliant colors of intestinal obstruction (Plates *A* and *B**).[4]

Surgical specimens photographed immediately in the operating room are preserved permanently in their original brilliance on film (Plate C*). The benefits of reconstructive surgery are graphically demonstrated by serial photographs in color (Plate D*).

Many busy surgeons do not wish to concern themselves with the time-consuming details of ordinary photography. Variable results due to differences in lighting, exposure time, and distances cause disappointment. The taking of measurements and the use of a light meter are onerous. The apparatus to be described attempts to answer these problems, reduces the time consumed to seconds, and eliminates the amateur photographer as a source of error.

The expense of the entire apparatus is extremely low, within the reach of the surgical resident who often sees pathologic material worth preserving for future reference or teaching.

Color transparencies, which are processed by the manufacturer and returned ready for use, have the widest applicability.

Description of Equipment.—The apparatus uses an ordinary 35 mm. roll film camera of popular make.* The camera is attached by its own threaded socket to fixed focus frames composed of ⅛ by ¾ inch steel bars with a wire reticule (Fig. 1). The reticule is ½ inch wider than the picture size at this distance, so that the wire is never in the finished photograph. The length of the bar is determined by the focal distance of the lens combination used.

A second bar mounting lights, a switch and a 15-foot roll of cord is belted to the first (Figs. 2 and 3). This combination has the following advantages:

1. Light, source and distance are constant.
2. The frame is always in focus.
3. The apparatus is adaptable to lesions or specimens of various sizes.
4. The camera settings are constant once the apparatus is standardized.
5. The apparatus can be kept set up and put in use very quickly.
6. At the set of speeds used, the apparatus can be hand held without fear that motion will ruin the picture.

This is not a new idea, but neither is the reticule or the frame a new idea. They are merely adaptations of ideas previously presented.[5]

In the operating room, where the shockproof switch is essential, it is possible to turn the light switch on the bar to the

*Color plate at end of article.

From the Caylord-Nickel Clinic, Bluffton, Indiana.
Submitted for publication April 7, 1951.

* Kodak 35.

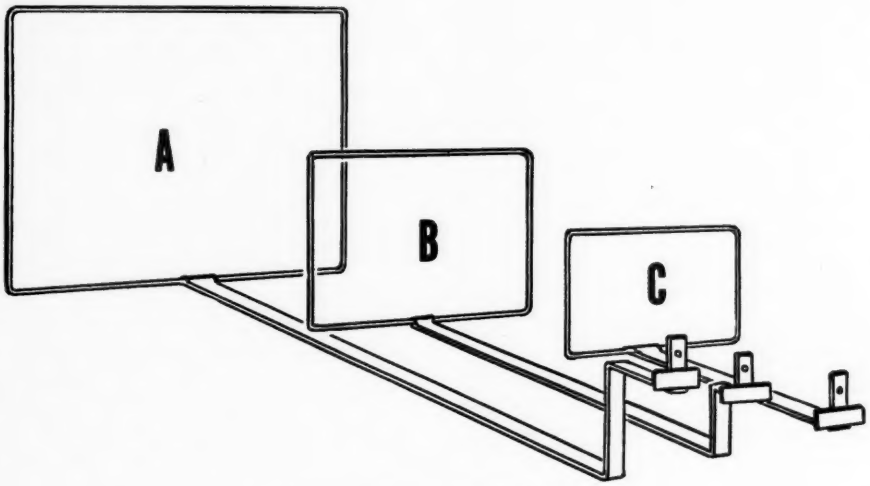


Fig. 1.—Line drawing of close-up frames.

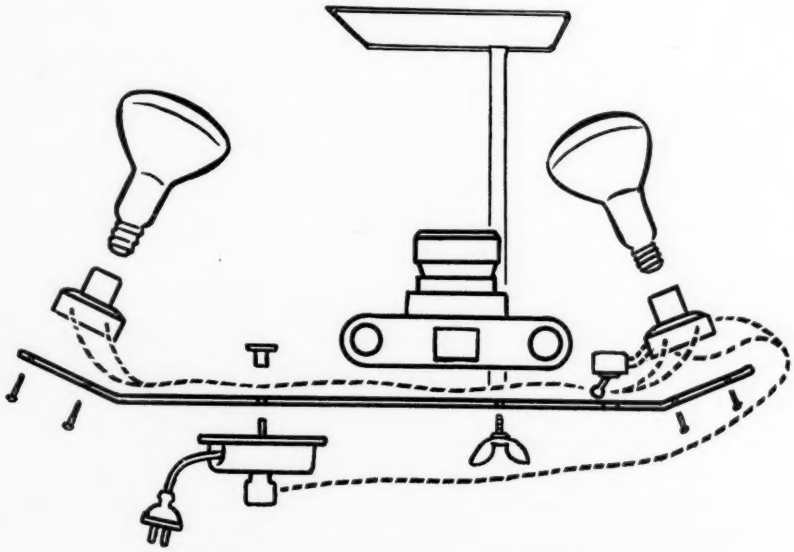


Fig. 2.—Line drawing of apparatus (breakdown).

"on" position and use the safety type switch at the wall for direct connection.

When structures at the bottom of a wound must be shown the bar can be used without the reticule. Cadmium plating reduces reflection and permits autoclaving without rust.

For use in the photography of surgical specimens and close-ups of patients the frame is ideal. Colored backgrounds may be simply pieces of plastic cloth* obtainable from any furniture store in a wide selection of colors, or, better still, trans-

* Duran.

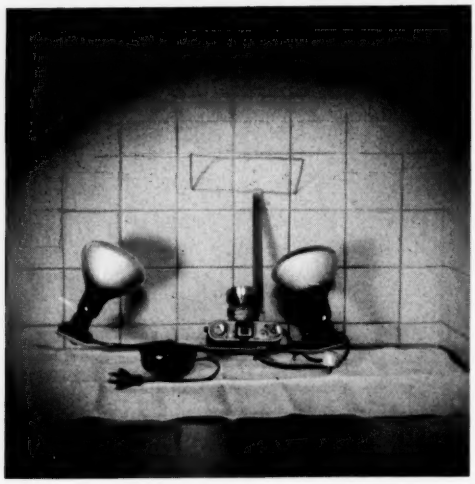


Fig. 3.—Photograph apparatus with close-up frame.

illuminated glass. The inclusion of a ruler and a small piece of paper with the patient's hospital or clinic number is worth while (Figs. 4 and 5).

In photographing larger parts of the patient, such as the trunk or the entire body, a handle can be fixed to the rod carrying the lights and the whole apparatus hand held (Fig. 6).

COMMENT

The value of the fixed focus frame in clinical photography is chiefly in the way in which the operation of taking the picture is simplified: (1) the light is constant; (2) the focus is constant, and (3) the film is constant. With all these factors controlled, a constant setting of the camera can be used. A light meter is not necessary. Therefore it is possible to keep the camera adjusted for the small frame and make a few changes for an intermediate or large frame. I use the 3 plus lens at a setting of 3½ feet at F 16 and 1/100 second for the small frame. For the intermediate and large frames I use a 3 plus lens at infinity and a 1 plus lens at 3½ feet respectively. The F settings or the time settings should be changed.

Colored drapes, particularly light blue or light green, are helpful in outlining the operative fields or for showing lesions on various parts of the body.

For surgical specimens the recommendations set up by Bohrod and Beiter[6] in regard to complementary colors are worth while.

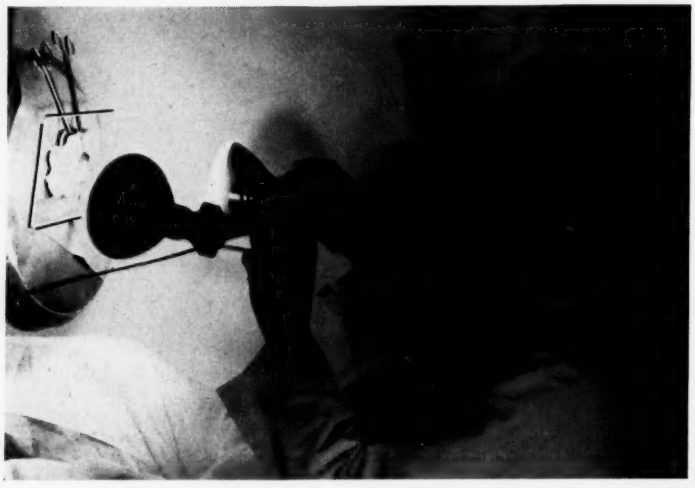


Fig. 4.—Photography of surgical specimens.

For background use in photographing larger portions of the anatomy[1d] a pale green or blue tiled wall, as found in many operating rooms, is satisfactory.

SUMMARY

1. An apparatus to simplify clinical photography for the surgeon is presented.

2. This apparatus is not new but a collection of old ideas adapted to an inexpensive 35 mm. camera.

3. The adaptation is such that the entire process can be carried out in a few minutes without loss of the surgeon's time and without prolonging the operation for the patient.

4. The materials needed are few and can be easily kept in the ordinary operating room closet.

RÉSUMÉ

1. On décrit un nouvel appareil photographique clinique plus pratique pour le chirurgien.

2. L'idée n'est pas neuve; simplement quelques modifications personnelles à un camera de 35mm.

3. Il en prend quelques minutes pour adapter l'appareil.

Fig. 5.—Photography of patient (close-up).

Fig. 6.—Handle for photographing larger parts of the body (in use).

4. Il n'y a pas raison de s'encombrer de beaucoup de matériel; le peu qu'il faut se place très bien dans une armoire ordinaire.

RESUMEN

1. Se presenta un aparato para simplificar la fotografía clínica quirúrgica.

2. En este aparato se adaptaron varias viejas ideas s una cámara de 35 mm. de bajo precio.

3. El proceso completo de adaptación puede efectuarse en unos cuantos minutos, sin pérdida de tiempo para el cirujano o la operación.

4. Se necesitan unos cuantos materiales que pueden guardarse en la propia sala de operaciones.

RIASSUNTO

1. E' presentato un apparecchio per semplificare fotografie cliniche ad uso del chirurgo.

2. Questo non é un nuovo apparecchio ma una collezione di vecchie idee adattate ad una poco costosa macchina fotografica di 35 mm.

3. Il dispositivo é tale che l'intero

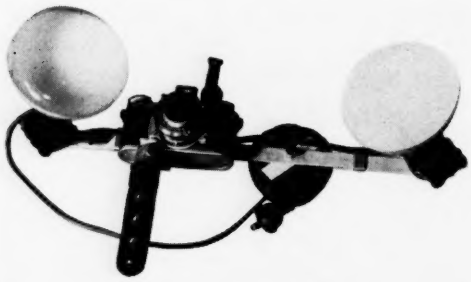


Fig. 7.—Handle for photographing larger parts of the body (detail).

procedimento può essere eseguito in pochi minuti senza sottrarre tempo al chirurgo e alla operazione stessa.

4. Il materiale necessario é esiguo e può essere facilmente tenuto in un ordinario armadio di sala operatoria.

ZUSAMMENFASSUNG

1. Es wird ein Apparat zur Vereinfachung der klinischen Photographie fuer den Chirurgen beschrieben.

2. Der Apparat ist nicht neu, sondern stellt eine Kombination alter Ideen dar, die an einer billigen 35 mm-Kamera angewandt werden.

3. Der ganze Vorgang kann bei diesèr Modifizierung in wenigen Minuten ausgefuehrt werden, ohne dass der Chirurg Zeit verliert oder die Operationsdauer verlaengert wird.

4. Die notwendigen Materialien sind gering und koennen mit Leichtigkeit in einem gewoehnlichen Operationssaalschrank untergebracht werden.

SUMÁRIO

1. Um aparêlho para simplificar fotografias clinicas para o cirurgião é apresentado.

2. Este aparêlho não é novo mas a coleção de velhas ideias adotadas com o uso de uma camara de 35 mms. pouco dispendiósa.

3. A adaptação é tal que o processo póde ser levado á cabo em poucos minutos sem disperdicio de tempo.

4. Os objectos necessarios são poucos e podem ser facilmente guardados no armário comum da sala de operações.

REFERENCES

1. (*a*) Fallon, J.: A Surgical Photographic Truck, J. Biol. Photographic Assoc. **16**:61-64, 1947. (*b*) Fallon, J., and Meyers, J.: The Photographic Museum, New England J. Med. **239**:740-743, 1948. (*c*) Fallon, J.: The Doctor as Photographer, A.M.A. exhibit, 1949. (*d*) Long, D. D.: Medical Photography Technic, Rocky Mountain M. J. **37**:113-114, 1940. (*e*) Roess, Stuart T.: A Simple Apparatus for Clinical Photography, Arch. Derm. & Syph. **60**:639, 1949.

2. Sutton, F. C.: Role of Medical Photography in the Hospital, J. Biol. Photographic Assoc. **16**:57-60, 1947.

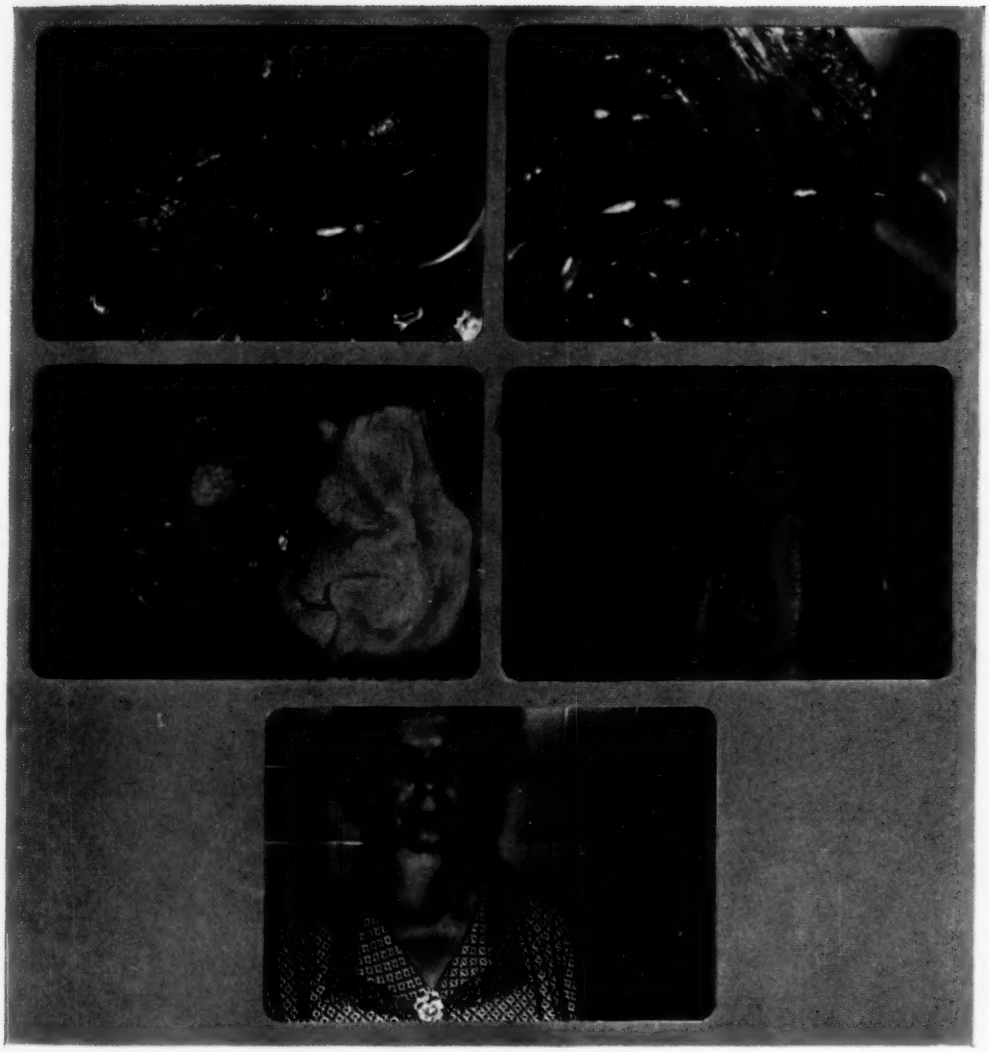
3. McComb, S. J.: Improvement of Illustration Value of Prints, J. Biol. Photographic Assoc. **16**:151-158, 1948. The Preparation of Photographs for Publication, Post. Grad. Med. **2**:438, 1947.

4. Footer, W.: Color Photography During Surgical Procedures, J. Biol. Photographic Assoc. **11**:16-18, 1942. Ingraham, F. D., and Cobb, C. A.: A Simple Method of Making Photographic Records under Sterile Conditions, J. Neurosurg. **4**:293-297, 1947. Pierce, E. C., and Bill, A. H.: A Compact Camera and Light Source for Photography under Sterile Conditions, Am. Surg. **130**:1104-1108, 1949.

5. Kodak Portra Censes and a Technique for Extreme Close-ups. Brochure, Eastman Kodak Co. McFarlane, J. W.: Technique for Ultra Close-ups, Photo-Technique. December 1941. Cited by (1) above. Multi-Purpose Photographic Instrument for Medical Photography, Radiog. & Clin. Photography **17**:33-36, 1941.

6. Beiter, J. J. and Bohrod, M. G. Kodachrome medical photography using transilluminated colored background. Radiog. & Clin. Photography, **20**:34-39,1944. Bohrod, M. G., and Beiter, J. J.:Photography in Color of Fixed Pathologic Specimens, J. Lab. & Clin. Med. **29**: 994-997, 1944.

7. Harding, F. R.: Clinical Photography in Orthopedics, Radiog. & Clin. Photography **15**: 52-56, 1939.



Color plates demonstrating various surgical conditions. *A* (upper left), the appearance of perforated peptic ulcer. *B* (upper right), photograph taken in a case of intestinal obstruction. *C* (center left), a dermoid cyst and its contents (shown on sponge). *D* (center right), plastic repair of the hand. *E* (center at bottom), photograph of patient with adenoma of the thyroid.

The Automatic Surgical Photographer

A. L. SORESI, M.D., F.I.C.S.
NEW YORK

SURGICAL photography heretofore has been an expensive and exceptional luxury, with consequent irreparable loss of pictorial records of interesting cases. The taking of surgical pictures ordinarily presented more difficulties than the taking of any other type of photograph. Even the best photographers had to be satisfied with surgical pictures which, pictorially and surgically, were far from perfect. The Automatic Surgical Photographer has reversed conditions. Not only is the taking of surgical pictures fully automatic, ideally simple and absolutely dependable, but surgical pictures taken with the Automatic Surgical Photographer are superior to pictures taken by the best photographers. A simple comparison between Figure 1, which shows how surgical photographs are taken by the best professional photographers, and Figure 2, which shows how it is done by the Automatic Surgical Photographer, is sufficient to indicate the validity of these statements.

Figure 1 shows schematically the fundamental differences. Disregarding the fact that surgeons and patients have to adapt themselves to the requirements of the professional photographer, it is obvious that the slant relation of camera and light source to the operative field and diffusion of the beam of light, with consequent distortions and disturbing shadows, are shortcomings that no professional skill can overcome.

Years ago I decided to tackle the problem of producing the perfect surgical film. At that time I put in writing all the requirements essential to do so and asked some colleagues to do the same. The conclusion was that the ideal surgical film should meet the following criteria:

1. It should furnish a candid, not a posed, reproduction of what surgeons and assistants do and see.

2. Blood must appear as blood in thickness and color, whether spurting from an artery, flowing freely from a vein or oozing from tissues. The film should show whether it is mixed with pus, bile or any other secretion; it should also show the actual handicap caused by bleeding.

3. The picture should have great depth in order to show with equal clearness the superficial and the deep tissues and organs.

4. All organs should show their distinctive characteristics as clearly as when visualized directly, even when differences in shape and color are not marked. For instance, loops of intestine should be distinguishable from one another; tendons, nerves and blood vessels should show clearly their distinct characteristics. Organs, instruments, drapery and the hands of the surgeons should appear as they really are, without distortion of color, size, shape or relations.

5. The taking of the picture should not retard, interrupt or handicap in any way the work of the surgeon; therefore, an automatic apparatus should be provided which would make it possible to take excellent pictures at any time of the day or night without the assistance of a professional photographer.

6. The cost of producing colored pictures should be moderate.

All these requirements are met by the Automatic Surgical Photographer, which takes automatically any kind of ordinary, still, stereoscopic or moving surgical pictures and is based on the fundamental principle of intense shadowless light and central focusing. The surgeon, without having his attention distracted in the least from his operative activities, operates it *by simply moving his foot* (Fig. 2).

Submitted for publication June 26, 1949.

Before describing the actual apparatus, which stems from one I described in 1934, I should like to emphasize the fact that credit and gratitude are due to those who have perfected the colored films, photoflood bulbs, coated lenses and shadowless operating lamps which make the Automatic Surgical Photographer so desirable an aid to the surgeon.

Many factors combine to produce the fine quality of pictures taken with the Automatic Surgical Photographer. First, the apparatus provides a shadowless and intensely brilliant light. The paramount importance of this factor can be appreciated only if the fundamental differences between black and white photography and color photography are clearly understood. In black and white photography shadows are essential; the beauty and effectiveness of the pictures depend on the skillful use of shadows, so that the lighter points contrast properly with the darker ones. In color photography shadows are detrimental; beauty and effectiveness depend on the faithful reproduction of certain colors which are completely negated or distorted by shadows. Colors are viewed in proportion to the amount of light reflected from them; consequently the film cannot reproduce true colors from shadowed points. Genuinely shadowless light is provided by the operating room lamps, which project the light on the operative field from a circular concave mirror. The shadowless light comes from the periphery of the lamp, the rays assuming a conical direction (Fig. 3). The camera can be secured in the very center of the lamp, without casting shadows, because all the rays of light come from the periphery. This means that the camera is placed in the ideal position for taking pictures of the whole operative field. As a matter of fact, the lens of the camera surveys a field broader than that seen by the surgeon and his assistants; consequently, the camera takes pictures which are actually more informative than direct vision. Faithful reproduction of the operative field, *which is actually a cavity,* is assured by the fact that the deeper portions are as shadowless and as intensely illuminated as the more superficial ones (Fig. 3). This gives the pictures a depth comparable to that obtained by stereoscopy. Ideal illumination of the operative field is automatically assured, because, obviously, the camera remains always in the center of the cone of light whenever operative conditions require a change in the position of the patient and consequent shifting of the light.

The smaller the opening used, the better the effects of depth, but the smaller the opening the more intense must be the light. A simple device assures the intensity of light required. Two photoflood bulbs (Mazda No. 4) are connected in series. One is located within the lamp,

Fig. 1.—Diagrammatic comparison of relations of sources of light, camera, operative field, surgical team and photographer when surgical pictures are taken by professional photographer and by the Automatic Surgical Photographer. *1*, slant relation of camera (*c*) and diffusion of light when pictures are taken by a photographer. Note that, besides inevitable distortion, the shadowed portion (*dl*) of the operative field (*d*) will, of necessity, be missed by even the most clever photographer. *2*, relations of conical beam of light, lens, operative field and surgeons. Note that camera (*c*), being situated at the very center of the operative field, visualizes it even better than the surgeons can, so that the picture will show every structure without distortion. This diagram also shows the assembled Automatic Surgical Photographer. It consists of the surgical lamp, two photoflood bulbs (*a* and *b*), connected in series, camera (*c*) and its support, plumb for exact centering and stand for electrical foot switch. Its efficiency and simplicity of operation make possible the taking of ideal surgical pictures by the mere pushing of the switch pedal by the surgeon's foot, which first disconnects bulb by allowing the full voltage to brighten up bulb *a* and thus illuminates intensely the operative field and automatically activates the camera. *3* (by permission of Carl Zeiss), sketch showing depth of focus of the operating field, so that all structures therein located will be in perfect focus. It shows also how the light is concentrated exclusively on the operative field, so that even when it becomes very intense it does not affect the surgeons, who are outside the beam of light, and why the camera, located in the dead center of the circular light, does not cast any shadow.

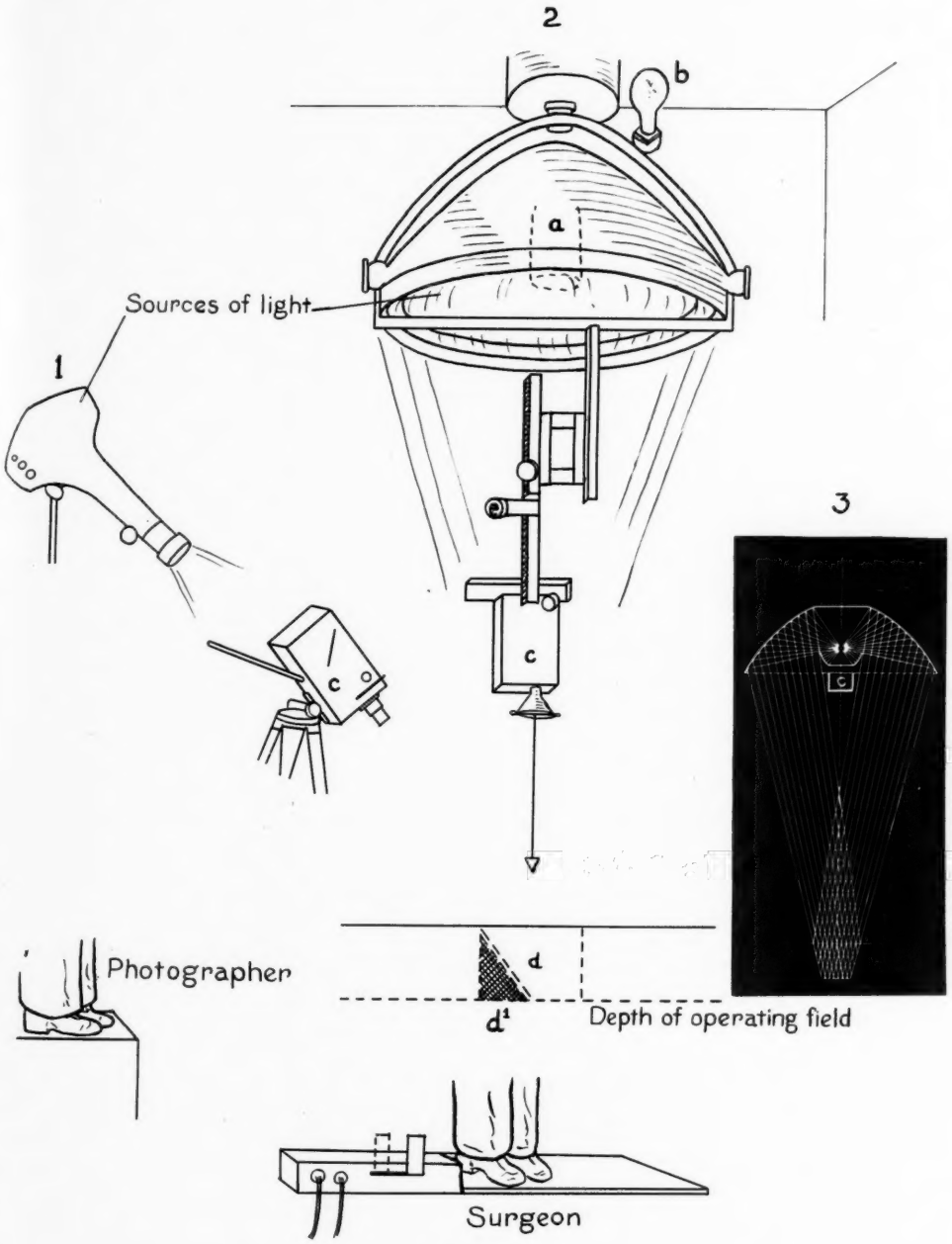

2
b
a
Sources of light
1
3
c
c
Photographer
d
d¹
Depth of operating field
Surgeon

Fig. 1.

the other on top of it. Both bulbs are illumined; thus each gets half the voltage of the ordinary electric current and gives as much light as the ordinary bulb used in the lamp for illumination of the operative field. While the pictures are taken the full voltage is turned into the bulb *within* the lamp, by switching off the one on top; this immensely increases the intensity of illumination of the operative field. The full illuminating power of the photoflood bulb, plus the concentration effected by the concave mirror, provides light of suitable intensity under any circumstances.

The Automatic Surgical Photographer consists of: (1) A support for the camera; (2) a wiring switch and support for the bulb on top of the lamp, and (3) a foot switch with wire connections (Fig. 2). The whole can be constructed and set up economically by any electrician.

The support of the camera consists of a strip of aluminum ¼ inch thick and 1½ inches wide crossing the lamp diametrically and secured to its metal frame by two short side strips. To this aluminum strip is screwed the support proper for the camera. In its simplest form it consists of a flat piece of aluminum with a screw similar to those found on tripods and serving the same purpose of securing the camera. The whole is constructed so that when the camera is set its lens corresponds to the exact center of the lamp. If it is desired to use intermittently a 35 mm. and a movie camera, there is no difficulty in constructing a support adaptable to both, provided it is remembered that the lens of the camera must correspond to the very center of the cone of light.

There is no difficulty either in securing the bulb on top of the lamp with a simple clamp or in wiring it so that the bulb can automatically be turned on and off with the foot switch.

The foot switch is just an ordinary two-step switch. The first step turns off the bulb on top of the lamp; the second turns on the current which activates the camera. Obviously it is essential that the foot switch turn off the top bulb *first*, so that the full voltage is turned into the bulb within the lamp; thus the operative field receives the full intensity of the photoflood light before pictures are taken.

The ideal cameras for surgical photography are those electrically motorized. Full electric motorization, in fact, is almost a "must" for cinematographic reproduction of surgical operations. The reason is self-evident. The ordinary spring motors which activate movie cameras need rewinding, which constitutes a hindrance, to say the least, during the operation. The greatest drawback, however, is the possibility that the motor may become unwound before the picture is completed.

Because movies of operations generally require more than the 100 feet of film held by ordinary 16 mm. movie cameras, it is advisable to add increased footage to the motorization of the camera. Fortunately these additions are well standardized and absolutely reliable, and the price is comparatively moderate.

I do not know of any still commercial camera that is electrically motorized. I have constructed such a camera, two of them, in fact: one for plain, the other for stereoscopic pictures. These two cameras work perfectly, though they are only adaptations of parts of various cameras and standard electric devices. However, I wish to emphasize the fact that still pictures can be as well taken with a spring motor camera as with a camera fully electrically motorized, and that stereoscopic cameras are not necessary, because the pictures obtained with the Automatic Surgical Photographer are really three-dimensional. On the market today there are excellent standard still cameras, either already motorized or turned into motorized cameras by the addition of standardized spring motors. The supply of still cameras adaptable to true color reproduction of surgical operations is ample enough to satisfy every requirement. There are 35 mm. cameras for double or single frame pictures, to most of which standard de-

Fig. 2.—Method used by professional photographers in taking surgical pictures.

vices for stereoscopic pictures can be attached. If economy is a consideration, 16 mm. magazine movie cameras equipped with release for still pictures are excellent. After an initial expense of less than $200 for equipment, beautiful and instructive surgical pictures can be obtained for a little less than one-quarter of a cent each. Over 2,000 pictures can be taken on a 50-foot roll of Kodachrome costing, development included, $6. These pictures, 8 by 16 mm., can be visualized on a screen or directly enlarged enough to show every detail satisfactorily. They provide an unimpeachable record for the protection of surgeons and hospitals.

The only difference in the construction of the apparatus when used with a fully electrically motorized camera and with a camera activated by a spring motor is, for the latter, the provision of a small electromagnet which, when activated, will press the starting button of the camera and thus start the photographic process ordinarily initiated by the finger of the photographer.

The Automatic Surgical Photographer is highly adaptable. It will work as ideally for those who must be satisfied with a single camera and a single lens as for those able to afford elaborate equipment.

In describing the *modus operandi* I shall not dwell on the fundamental principles of photography or on factors that vary with each camera and lens and can be explained in detail by the dealer. I shall present only the data necessary to set up the Automatic Surgical Photographer, which is very simple, because the best light for photography is also best for surgery.

Pictures are improved by protecting the lens with a shield. Poor centering and poor focusing are made impossible by centering the lens at the exact height, with a plumb line made of sterilizable material (rustless chain and a plumb), provided at the free end with two hooks, which are fitted in two eyelets placed on the shield or on the metal frame of the lens, if a shield is not used. When the operative field is ready to be photographed, the

sterile plumb line is hooked to the lens, so that the plumb falls on the very center of the structures which the surgeon considers the most important. However, because the operative field is actually a cavity of more or less depth and the structures surrounding the central ones often are also important, two points should be remembered. Each type of lens has a peculiar depth of focus; i. e., objects located within it will be perfectly focused. Consequently the surgeon must know the depth of focus of the lenses he uses and set the point of the plumb in the middle of the thickness of the tissues and organs he intends to photograph, so that they are all in perfect focus. A single example will suffice to show how easy it is to focus perfectly even the organs located in the deepest operative cavity. Take the case of an enlarged, adherent gallbladder. The surgeon wishes to show not only the gallbladder as it appears when the abdomen is opened, but its hidden connections with deeper organs and how he separates it from them, plus, perhaps, some additional intervention on the common duct. His experience will tell him that he must deal with organs located about 3 inches deeper than the upper visible surface of the gallbladder. Consequently, after he has set the point of the plumb on the center of the gallbladder, the lamp, and with it obviously the lens of the camera, is lowered 1½ inches. The mathematical focal center will then be exactly in the middle of the thickness of the structures to be photographed, and all will be properly focused.

Coated lenses are preferable because they eliminate glare and bring out truer colors. Ordinary lenses can be coated at moderate prices. For those who can afford them, lenses of various focal lengths are highly recommendable. Their great usefulness in surgical photography lies in the fact that, without the need of moving the camera, the size of the field and of the structures photographed can be immediately changed to suit special purposes. Let us consider the ordinary 50 mm. lens. With this lens at 36 inches the field will be about 28 inches. By simply substituting a 100 mm. lens, one reduces the field to 14 inches and the structures will appear in the photograph twice as large. As a general rule, it can be stated that increase in the focal length of the lens results in proportionate increase of the size of the objects photographed and proportionate decrease of the field.

The distance of the lens from the operative field, the width of the field photographed at various distances and with various lenses, the time of exposure and the opening of the diaphragm must be predetermined with accuracy. This is easy for anyone versed in ordinary photography. If the surgeon is not sure of himself, he should ask the dealer to set up the whole apparatus for him. Once this has been done, the actual taking of the pictures is truly 100 per cent automatic and failure-proof.

A last consideration: Surgeons should familiarize themselves with the use of the exposure meter, because proper exposure is essential to taking ideal pictures under any circumstances.

Two factors will render advisable the modification of the opening of the diaphragm and/or the time of exposure. One is the gradual burning of the photoflood bulb, with consequent decrease in intensity of light. The other is the reflection of light, which greatly differs in certain organs and pathologic conditions. When dark organs like the liver or an enlarged spleen occupy the center of the picture they will obviously reflect light differently from a shining, semitransparent large ovarian cyst; consequently the proper opening of the diaphragm and/or time of exposure should be determined with an exposure meter.

The taking of pictures by this device during an operation is no impediment whatever to the normal course and performance of the operative procedure. When the surgeon decides that a picture should be taken, there need be no modification in operating routine. The operation proceeds unhampered and undisturbed; a

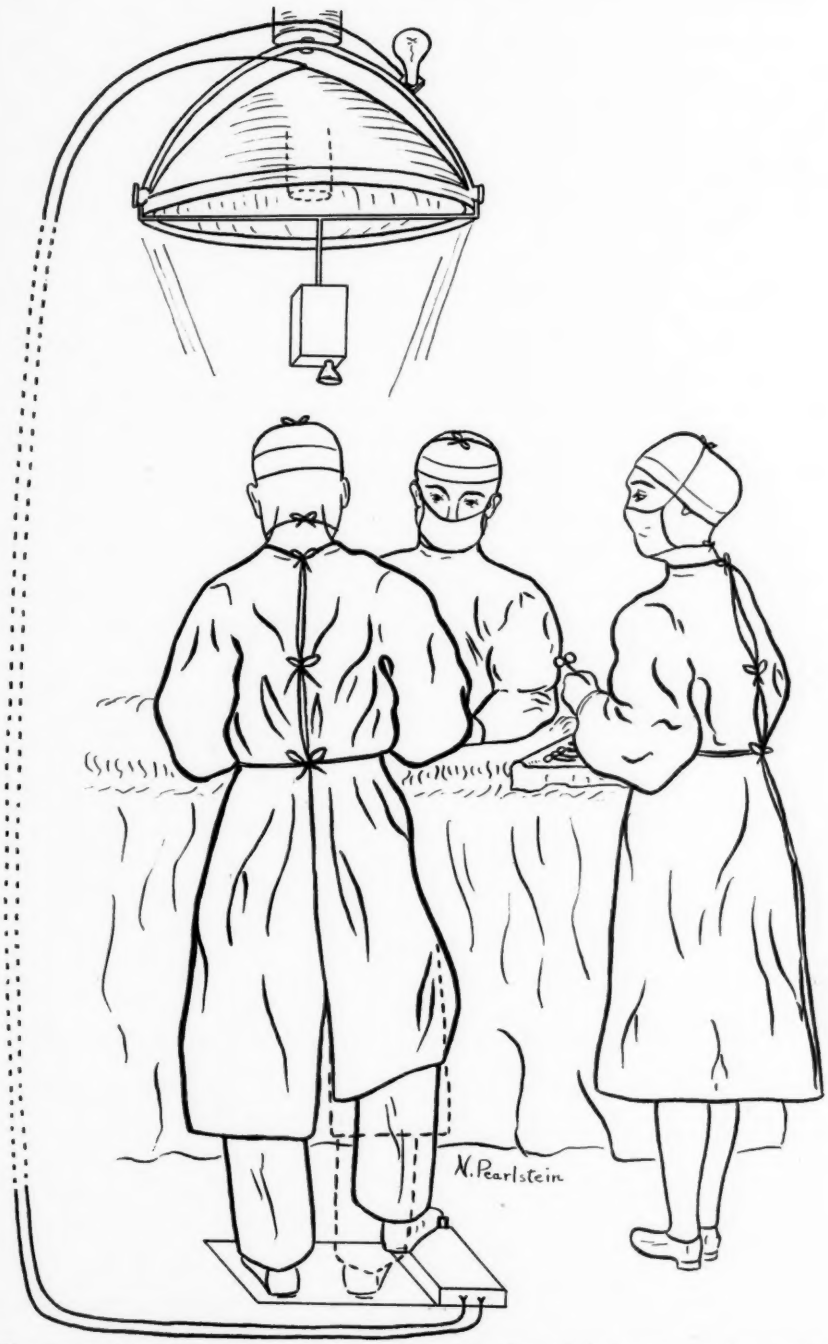


Fig. 3.—Sketch showing how a mere turning of the foot of the surgeon activates the Automatic Surgical Photographer.

mere motion of the surgeon's foot (Fig. 2), is all that is required. This soon becomes as automatic as gear shifting. Even the sudden increase in the intensity of the light passes unobserved after a while, because it does not affect directly the eyes of the operating staff.

SUMMARY

The Automatic Surgical Photographer, a new device for the pictorial recording of surgical procedures, is highly recommended by the author for the following reasons:

1. It can be used in taking whatever kind of pictures are desired; still photographs, three-dimensional pictures and moving pictures.

2. Its accurate reproduction of natural color is outstanding.

3. It is simple to operate, requiring only a slight movement of the surgeon's foot.

4. Its use involves no interference whatever with the progress of the operation.

5. It is easily installed, and the cost of its use is moderate.

In the author's opinion the Automatic Surgical Photographer should be standard equipment in every operating room, not only because of the scientific value of accurate pictorial representation but as a protection for both surgeons and hospitals.

RÉSUMÉ ET CONCLUSIONS

L'appareil photographique automatique employé en chirurgie permet la prise en ciné ainsique des photos à trois dimensions en couleur d'une beauté et d'un naturel insurpassables tout en ne nuisant pas du tout au cours de l'opération. Non seulement cet appareil peut prendre de meilleures photographies qu'un photographe expérimenté, mais il permet au chirurgien, par un simple mouvement de pieds, d'enregistrer automatiquement un temps opératoire à l'instant propice et voulu. Il est toujours de garde jour et nuit à l'instant précis ou ses services sont requis. D'installation facile et de maniement automatique, il n'est pas d'un coUt élevé. L'équipement doit être standard dans toutes les salles d'opérations modernes parce que rien n'est plus instructif qu'une reproduction imagée et fidéle de chaque opération et spécimen. A l'aide de cet appareil on peut obtenir de telles fiches à un coût minime entoutes circonstances.

RESUMEN Y CONCLUSIONES

El Fotógrafo Quirúrgico Automático hace posible la toma de películas cinematográficas quirúrgicas, así como fotografías a colores tridimensionales de insuperable belleza y exactitud, efectuándose la operación sin el más ligero inconveiente. No solamente puede tomar fotografías quirúrgicas mucho mejor que el mejor fotógrafo, sina que puede hacer lo que a nadie sería posible hacer, pues por la simple acción del pie del cirujano puede registrar de inmediato ocurrencias operatorias automáticamente, instantáneamente e idealmente. Se encuentra siempre listo para servir, día y noche, en el instante en que son requeridos sus servicios. Puede instalarse fácilmente y funcionar automáticamente a un costo muy moderado. Debería ser equipo regular en toda sala de operaciones moderna, porque no hay nada más instructivo que un registro fotográfico exacto de cada operación y pieza operatoria. Estos registros pueden obtenerse con este invento al costo de unos cuantos centavos en todas circunstancias.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Der "Automatische Chirurgische Photograph" ermoeglicht sowohl die Herstellung chirurgischer kinematographischer Filme als auch stereoskopischer Farbbilder von unuebertrefflicher Schoenheit und Naturtreue, ohne den Ablauf der Operation im geringsten zu behindern. Nicht nur kann der Apparat chirurgische Aufnahmen viel besser ausfuehren als der beste Photograph, er kann auch etwas leisten, was auf keine andere Weise erreicht werden kann; auf eine einfache

Drehung des Fusses des Chirurgen hin naemlich kann der Apparat ploetzliche Vorgaenge waehrend der Operation automatisch, unverzueglich und mit idealer Genauigkeit festhalten. Der Apparat ist stets arbeitsbereit, Tag und Nacht, im Augenblick wo seine Dienste gebraucht werden. Er kann leicht angeschlossen werden und arbeitet automatisch mit sehr geringem Kostenaufwand. Der Apparat sollte zur obligaten Ausstattung jedes modernen Operationssaales gehoeren, weil es nichts Lehrreicheres gibt als eine naturgetreue bildmaessige Registrierung jeder Operation und jedes chirurgischen Praeparates. Derartige Dokumente koennen mit Hilfe der Maschine in allen Faellen fuer wenige Pfennige hergestellt werden.

RIASSUNTO E CONCLUSIONI

Lo "Automatic Surgical Photographer" rende possibile sia la ripresa di cinematografie chirurgiche, sia fotografie a colori tridimensionali di insuperabile bellezza e fedelta', durante il procedimento chirurgico e senza il minimo disturbo.

Detto apparecchio non solo puo' ritrarre fotografie chirurgiche perfette, quali nessun fotografo potrebbe, quanto puo' con un semplice movimento del piede del chirurgo ritrarre particolari operatori istantaneamente, automaticamente in maniera ideale. E' pronto sempre, giorno e notte, serve all'istante.

L'apparecchio puo' essere installato facilmente ed essere tenuto in uso ad un costo essai moderato. Dovrebbe essere una normale attrezzatura di una moderna sala operatoria perche' nulla e' piu' istrut ivo di una fedele riproduzione di ogni-operazione e pezzo patologico.

On questo dispositivo tali riproduzioni possono essere ottenute al costo di poche lire in ogni circostanza.

SUMÁRIO E CONCLUSÕES

O Fotógrafo Cirurgico Automatico tórna possivel a filmagem de peliculas tri-dimensionais de inegualavel beleza e fidelidade e sem o menor estôrvo. Além de tomar melhóres filmes do que qualquer fotógrafo, pelo simples apertar de um botão de pé, o proprio cirurgião recólhe instantanea e automaticamente, de uma maneira ideal, as ocorrencias momentaneas do áto cirurgico. Está sempre pronto para ser utilizado, dia e noite, no momento que seus serviços são requeridos. Póde ser facilmente instalado e usado automaticamente por um preço bastante módico. Deve fazer parte de todos os conjuntos cirurgicos modernos porque não ha nada mais instrutivo do que um filme fiel de toda operação e do espécime. Com este acessorio, tais documentarios podem ser obtidos por um custo irrisorio em todas as circunstancias.

Copies of the Revised Constitution and Bylaws
Are Now Ready for Distribution

All who are interested in membership qualifications should write to the

Secretary, International College of Surgeons

1516 Lake Shore Drive Chicago, Ill.

Roentgen Irradiation of the Adrenal Glands*

Results of Indirect Hormonal Research

MANUEL A. MANZANILLA JR.
MEXICO D.F., MEXICO

SOME time ago it was observed that, in certain organisms, roentgen irradiation produces variations in the blood sugar content.[1] This effect has been attributed primarily to the adrenal gland, which, as is known, varies functionally in response to roentgen rays applied either directly over the glandular zone or indirectly over the body area or a segment thereof. With reference to direct application, a case is cited[2] in which chronic adrenal insufficiency was produced by irradiation of a neoplasm on the dorsolumbar portion of the vertebral column. Exposure of the adrenal gland to roentgen rays may also eventuate in hemorrhage, degenerative change, reduction of lipids[3] and morphologic modifications, which occur predominantly in the adrenal cortex but may affect the medulla in a lesser degree.[4] As for indirect application of roentgen rays, Desjardin[5] in 1928 obtained evidence of this action by observing that irradiation of the body produces adrenal hypertrophy, which does not appear when the area directly over the gland is irradiated. Lately, White and Dougherty[6] noticed lymphoid changes produced in rats by body irradiation, which resulted at the expense of the integrity of the adrenohypophyisial system. Patt[7] has said that total body irradiation is accompanied by diminution of adrenal cortical cholesterol. He also pointed out a similarity between the symptoms of experimental adrenal insufficiency and those produced by irradiation. Ellinger[8] confirmed this last observation, noting that mortality among the irradiated rats diminished with use of acetate of desoxycorticosterone.

The effects of direct roentgen irradiation over the adrenal gland are difficult to distinguish from those of indirect irradiation, owing to the impossibility of confining the irradiation to the glandular zone and also, as Le Blond and Segal[9] pointed out, to the fact that roentgen rays produce chemical compounds in the organism, products of cellular disintegration which exert their action at a distance from the irradiated point. Nevertheless, from experience thus far recorded, there is evidence that roentgen rays produce adrenal changes both by direct application the gland and by indirect application over the body area or segments thereof, and that these changes can be related to functional variations. There is also evidence that indirect roentgen irradiation causes modifications in the blood sugar level.

With regard to blood sugar variations following direct irradiation of the adrenal glands in man, and excluding some experiments[10] in the treatment of diabetes mellitus from which no conclusions can be drawn, their are no reports available, nor have these. Variations in the blood sugar level and their relation to the functional changes produced in the gland have not been reported heretofore.

In consideration these points, and with the purpose of ascertaining the influence of adrenal irradiation in man, particularly on the blood sugar content in relation to glandular activity, my associates and I have irradiated the adrenal zone and observed the resultant blood sugar curves and the circulating eosinophils, the latter as an indicator of adrenal cortical function. Recant, Hume, Forsham and Thorn[11] consider this test very sensi-

*Research Award paper in the First Ciba Hormonal Contest, March 1951, Mexico. Presented under the patronage of Prof. Dr. Manuel A. Manzanilla, F.I.C.S. (Hon.), Prof. Dr. Francisco Fonseca, F.I.C.S. (Hon.), and Prof. Dr. Gerardo Varela, C.P.H.

Submitted for publication June 15, 1951.

tive, claiming for it certain advantages over determination of the cetosteroid excretion.

We have previously observed cytohematic variations, after direct irradiation of the adrenals, which are related to changes of adrenal function.[12] This research has been done in an attempt to identify the phenomena related to adrenal function, since this knowledge may prove to have some therapeutic value.

Earlier Work.—It is well known that both the presence and the functional state of the adrenal tissue determines certain changes in carbohydrate metabolism, in the absorption of dextrose through the digestive tract, in the blood sugar curve, in hepatic glycogen content, in the oxidation of dextrose and in glyconeogenesis. It is important here to note the effects of the adrenal gland on these glycemic values, because variations noted after irradiation are closely related to them; however, it should be kept in mind that the blood sugar content is merely an expression of the greater or lesser functional magnitude of other physiologic phenomena, particularly the oxidation of dextrose and glyconeogenesis.

In almost all animal species, adrenalectomy results in decrease of the blood sugar content. In the normal rat, hypoglycemia is produced;[13] in the rat rendered diabetic by pancreatectomy it produces a partial diminution in excretion of sugar by the urine as compared with that of control animals.[14] In the adrenalectomized cat there is a decrease in the blood sugar content due to the adrenal cortical insufficiency resulting from the operation,[15] which also effected improvement of diabetes in the pancreatectomized animal. In the dog[16] the effect is the same as in the cat;[17] a decreased excretion of sugar in the urine is noted when the dogs are treated with phloridzin.[14a] Finally, in the monkey, adrenalectomy produces marked hypoglycemia.[18]

This glycemic decrease in adrenalectomized animals is referable to the adrenal cortex, since anatomic or functional suppression in the medulla does not, without participation of the cortex, produce such variation.[19]

In contrast to the effects of adrenalectomy, the administration of adrenal extract produces hyperglycemia,[20] augments diabetes in partially pancreatectomized animals;[21] and other animals after adrenalectomy and pancreatectomy[22] and increases the urinary excretion of sugar in adrenalectomized animals treated with phloridzin.[23] Lately it has been noticed that such effects of adrenal extract are due to the sugar-regulating hormones or "S" hormones, which are: 11, oxysteroids, Compound A of Kendall (11, dehydrocorticosterone), Compound B of Kendall (corticocosterone), 11, 17 oxysteroids, Compound E of Kendall (17, hydroxy 11, dehydrocorticosterone) and Compound F of Wintersteiner (17, hydroxycorticosterone),[24] the two last mentioned being the most active of all.[25]

The association of adrenal cortical hyperfunction with hyperglycemia and of adrenal cortical hypofunction with hypoglycemia is observable also in man. Hypoglycemia is frequently encountered in cases of Addison's disease,[26] associated with a diminished excretion of glycogenic corticoids.[27] Also, although not with the same frequency, a similar glycemic variation exists in cases of cortical hyperplasia or tumor and in cases of diabetes mellitus;[28] in such processes an increase in excretion of glycogenic corticoids is noted.[27] Besides, administration of Compound E of Kendall to man produces hyperglycemia, although it does not induce a tendency to diabetes.[29] Aside from these relations, which are more or less established, there exists an apparent contradiction; i.e., the association of diabetes mellitus with Addison's disease.[30] This, as Emerson, Parkin and Howell[31] have suggested, may be due to a dissociation in the production of glycoregulator corticoid hormones with respect to the other hormones of the adrenal cortex; these authors have observed that the excretion of glycocorticoids is maintained independently of the presence of manifestations of adrenal cortical insufficiency.

Finally, it should be pointed out that, although anatomic or functional suppression of the adrenal medulla does not produce glycemic variations in the experimental animal, we have observed both in normal man and in diabetic patients a fall in the blood sugar level after denervation of the adrenal glands.[32]

Hence, from what has been said, the relation of adrenal cortical hyperfunction to hyperglycemia and that of adrenal cortical hypofunction to hypoglycemia exists both in animals and in man, while in man under basal conditions appears the relation of adrenomedullary hyperfunction to hyperglycemia and that of adrenomedullary hypofunction to hypoglycemia.

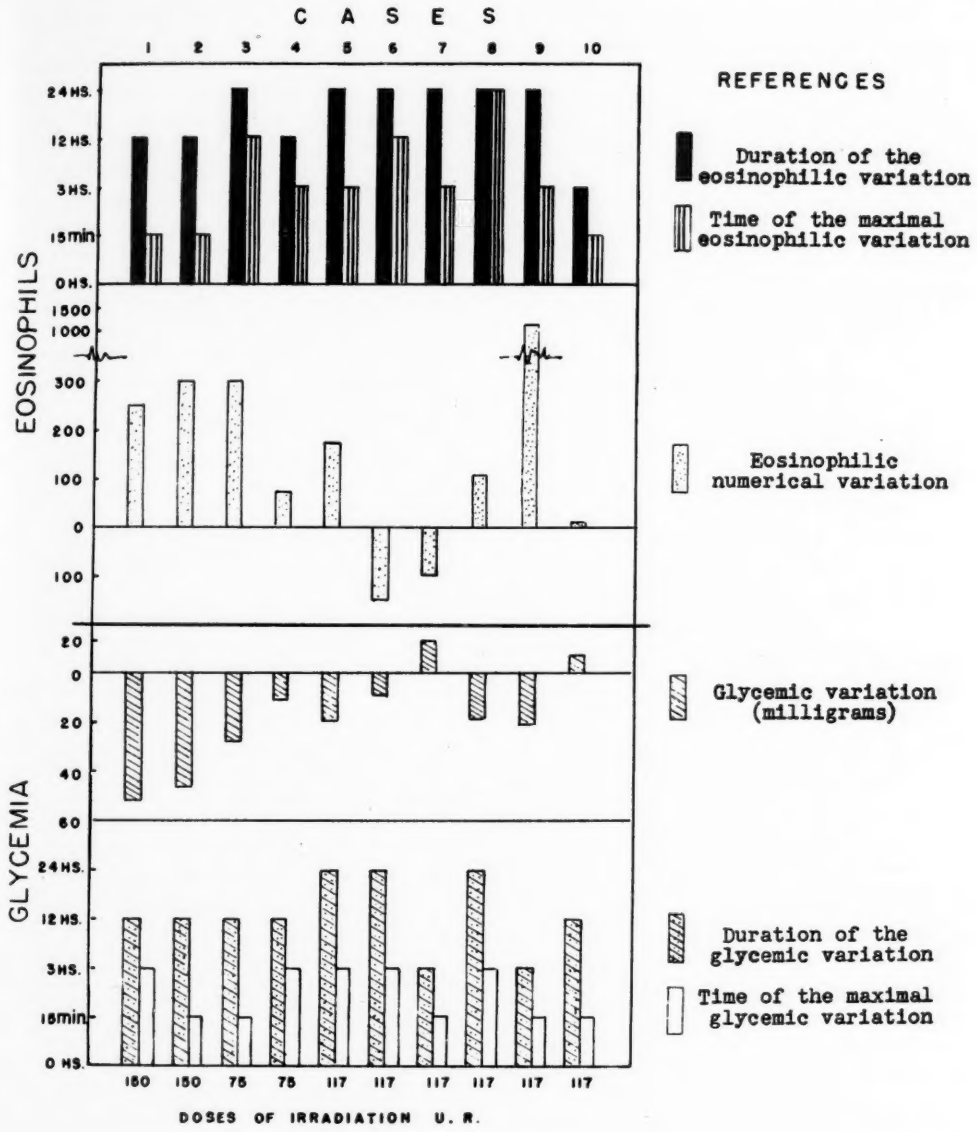
With regard to eosiniophilic variations related to the adrenal gland, Dalton and Selye[33] in 1939 showed that esoinopenia in rats is one characteristic of the alarm reaction; and in 1948 Hills, Forsham and Finch[34] showed that the ACTH hormone and Compound F of Wintersteiner produce a decrease in the number of eosinophils (this was corroborated by several investigators).[35] Clinically it has been observed that in the presence of Cushing's syndrome, in which the glycogenic cetosteroids as well as the glycogenic corticoids are usually increased, eosinopenia is observed.[28d] With adrenal insufficiency, in which both the cetosteroids[36] and the glycogenic corticoids[27] are invariably diminished, eosinophilia is present.[37] In the syndrome of virilism, in which the cetosteroids are markedly increased[36] while the glycogenic corticoids are normal,[27] there is no abnormal eosiniphilic variation.[37b] This clinical parallelism between the variations of the glycoregulator hormones and the eosinophils has been verified by several investigators, and these hormones have been considered to exert great influence upon the eosinophils.[25] In addition, the clinical relation of adrenal cortical hyperfunction to eosinopenia and that of adrenal cortical hypofunction to eosinophilia are verified by the experimental evidence and clinical applications of Forsham, Thorn, Prunty and Hills.[38]

With respect to the relation between eosinophils and epinephrine, Speirs and Meyer[39] observed that the latter substance produces eosinophilia in adrenalectomized animals, while in normal animals it produces eosinopenia. This action is attributed to the fact that epinephrine increases adrenal cortical secretion in several ways.[40] Finally, it has been shown in man that injection of epinephrine produces eosinopenia,[41] which is less intense in the presence of Addison's disease or anterohypophysial insufficiency.[11] It should be mentioned also that the injection of nor-epinephrine has almost no decreasing effect on the number of eosinophils.[42] Thus it may be concluded that epinephrine produces eosinopenia which depends on the functional state of the adrenal cortical tissue, producing only eosinophilia when it acts independently of this tissue.

Procedure.—Ten experiments in irradiation of the adrenal glands were per-

Method Used in Irradiation Studies

Group	Case Nos.	Kilovolts	Milliamperes	Distance, Cm.	Filtration	Time, Minutes	Dose, Roentgens
A	1 and 2	180	5	50	0.5 mm. Cu, 1 mm. Al	5	150
B	3 and 4	180	5	25	0.5 mm. Cu, 1 mm. Al	5	75
C	5, 6, 7 and 8	130	10	50	3 mm. Al	5	117
D	9 and 10	130	10	50	3 mm. Al	3	117



formed on 5 healthy persons, the blood sugar content having been ascertained by the method of Folin and Wu[43] before irradiation and at fifteen minutes, three hours, twelve hours and twenty-four hours after irradiation. The number of eosinophils was determined by the technic of Thorn and Forsham,[44] modified from Dunger; these were recorded at the same intervals as the dosages of dextrose.

We proceeded as fast as possible to avoid errors caused by cellular lysis. The type and dosage of irradiation were established by Dr. Manuel F. Madrazo (see table).

Results.—In all 10 cases in this series a variation in the blood sugar content was produced; in 8 a decrease was observed, and in the remaining 2 an increase. In 5 cases the point of maximum intensity in variation was found to correspond to the value for blood sugar as determined three hours after irradiation; in the other 5 it corresponded with the value noted fifteen minutes after irradiation. The duration of glycemic variation was twelve hours in 5 cases, twenty-four hours in 3 cases and three hours in 2 cases. Expressed in milligrams, the decrease in blood sugar content from the pre-irradiation level ranged from a minimum of 10 to a maximum of 54 mg. In the cases in which an increase was noted, the increase amounted to 20 mg. in 1 case and 10 mg. in the others. Neither increase nor decrease showed any relation as to character or intensity with variation of the stimulus. With 2 persons subjected to the same type of stimulus, an increase in blood sugar was obtained in one adrenal gland and a decrease in the contralateral gland (Cases 5 and 6 and Cases 7 and 8).

Similarly, variations in the number of eosinophils were observed in every case; in 8 an increase was noted, and in the other 2 a decrease. The point of maximal intensity of variation in 4 cases corresponded with the count three hours after irradiation; in 3 cases, with the fifteen-minute post-irradiation count; in 2 cases, at the twelve-hour count, and in 1 case with the count taken three hours after irradiation. The variations lasted twenty-four hours in 6 cases, twelve hours in 3 cases and three hours in 1 case. Increase above the preirradiation eosinophil count ranged between a minimum of 12 and a maximum of 1,173; decrease below the same in 1 case was 156, and in another, 96. Neither increase nor decrease in the number of eosinophils varied with variation of the stimuli employed. Two persons treated with similar stimuli showed an increased number of eosinophils in one adrenal gland and a decreased number in the other (Cases 5 and 6 and Cases 7 and 8).

In comparing the character and intensity of both glycemic and eosinophilic variations after irradiation, it was observed that in 8 cases an increase of eosinophils and a decrease of the blood sugar content were associated and that this relation was not present in the other 2 cases (it should be pointed out, however, that in these 2 cases both the glycemic and the eosinophilic variations were of minimal intensity, whereas both were of marked intensity in the other 8). Also, the intensity and duration of the eosinophilic variations were greater than those of the glycemic variations as related to levels noted under physiologic conditions. In the cases in which the two kinds of variation coexisted after irradiation, the eosinophilic variation greatly exceeded the variation in the blood sugar level.

COMMENT

The most important observation obtained from this study is the frequency, duration and intensity of the glycemic decrease associated with a numerical increase of eosinophils. Except in Cases 6 and 10 (in which both types of variation were slight) a definite relation between these two factors was noted, and it seems justifiable to conclude that the variations in both were due to the irradiation. Slight modifications in the blood sugar level alone may have little or no significance, but the obvious relation between these modifications and the variations observed in the eosinophil count indicates a change of adrenal function directly attributable to roentgen irradiation.

Theoretically irradiation of the adrenal glandular zone stimulates both cortex and medulla. It is necessary, therefore, to ascertain which of these two components is responsible for the variations observed.

The numerical increase of eosinophils may indicate (1) inhibition of adrenal cortical secretion, since eosinophilia is associated with secretory decrease; (2) inhibition of medullary secretion associated with normal function of the cortex, since in normal man the secretion of epinephrine seems to be continuous (as we have observed in previous studies[34] of functional adrenal denervation, using the blood sugar level as the biologic reactor) and since epinephrine stimulates adrenal cortical secretion in several ways; and (3) stimulation of the adrenal medulla by deficient cortical function analogous to that observed by Speirs and Meyer,[39] who observed that epinephrine produces eosinophilia in the absence of adrenal cortical tissue.

Decrease in the blood sugar content, on the other hand, may be taken to indicate (1) inhibition of cortical secretion, since hypoglycemia is associated with secretory decrease, or (2) inhibition of medullary secretion, since functional denervation of the adrenal gland produces hypoglycemia.[34] The coexistence of an increased eosinophil count and a decreased blood sugar content may form the substratum of the responses observed. Since epinephrine is only one element to be considered with regard to cortical secretion, the medullary factor alone cannot explain the presence of eosinophilia of the magnitude observed. Also, with respect to the third factor mentioned above in discussing eosinophilia, no case of adrenal insufficiency similar to the experimental case of Speirs and Meyer[39] has been observed by us. Thus, although participation of the adrenal medulla cannot be disregarded, it is our opinion that the decreased blood sugar content and the increased eosinophil count may be due primarily to inhibition of adrenal cortical secretion.

With regard to the comparatively slight variation in the blood sugar level as compared with that in the eosinophil count, it seems logical to assume that the difference may be due to the homeostatic mechanisms that act upon carbohydrates,[45] the majority of which tend to prevent decreases in the blood sugar content.[45d] It seems reasonable to suppose that the glycemic levels observed are to some extent compensated by such mechanisms. This is in contrast to the variations in the eosinophil count, for which no similar homeostatic mechanism appears to exist.

It is interesting to note that these adrenal cortical hormonal compounds affect the number of circulating eosinophils by their influence over carbohydrate metabolism, since the eosinophil count is considered to indicate variation in secretion of the 11, 17 oxysteroids. They also determine the urinary secretion of this group[46] and the uric acid-creatinine relation.[47]

In our opinion, therefore, the increase in blood sugar and the decrease in eosinophils in this study were due primarily to inhibition of adrenal cortical secretion and particularly of the 11, 17 oxysteroids.

Finally, the fact that neither the glycemic nor the eosinophilic variations, in their respective increase and decrease, showed any relation to the stimulus as regards either character or intensity, if taken together with the fact that both responses were produced in the same subject by means of identical stimuli, indicates that *responses produced by roentgen rays in the adrenal glands depend in part on the functional state of each gland.*

CONCLUSIONS

1. Glycemic variations are produced in man by roentgen stimulation of the adrenal glands.

2. These variations consist primarily of a decrease in the blood sugar content and an increase in the number of circulating eosinophils. In the author's opinion, this effect is attributable to inhibition of adrenal cortical function, particularly of the secretion of 11, 17 oxysteroids.

3. The extent of glycemic variation from the normal is less than that ob-

served in the number of eosinophils. This may be attributed to the effect of the homeostatic mechanisms which influence the glycemic level.

4. In this study there was apparently no relation between the particular stimulus employed and the type of response observed.

5. The adrenal glands of one subject may show different responses to identical stimuli. This may be attributed to the functional state of each adrenal gland considered separately from the contralateral gland.

6. The variations in blood sugar content associated with eosinophilic variations, together with other cytohematic and hematochemical changes, may prove to be of value as a contribution to knowledge of the adrenal glands, and their function in certain clinical and surgical manifestations of disease. They may also be of some therapeutic importance, particularly to supply the indications for irradiation in some pathologic states referable to or involving the adrenal glands. Also, if a surgeon is confronted with a patient who has undergone total unilateral adrenalectomy, he must ascertain the presence and function of the contralateral gland in order to avoid disaster.

SUMMARY

The glycemic variations associated with changes in the eosinophil count have been studied as constituting an indirect adrenal hormonal expression, the purpose being to evaluate the phenomena related to normal and abnormal function of the adrenal glands and the possible application of these phenomena to certain clinical and surgical conditions, as well as to estimate their possible therapeutic value.

RÉSUMÉ

Les variations de la glycémie avec une éosinophilie différenciée ont été étudiées en rapport avec le s hormones des glandes surrénales. Le but de ces études est pour apprécier la fonction normale ou anormale de la surrénale et de t enter d'expliquer certains phénomènes tant au point de vue clinique que chirurgical et d'évaluer la possibilité d'une thérapeutique.

RESUMEN

Se estudian las variaciones glucémicas asociadas a las eosinófilas, como expresión hormonal suprarrenal indirecta, empleando la estimulación röntgen, con fines a la identificación de fenómenos relacionados con la presencia y función suprarrenal, de posible utilidad en determinadas condiciones de importancia clínica, quirúrgica y quizás terapéutica.

RIASSUNTO

Le variazioni glicemiche associate con variazioni eosinofile sono state studiate quale espressione indiretta degli ormoni surrenali, con lo scopo di valutare il fenomeno in rapporto alla funzione normale e patologica delle ghiandole surrenali. Sono studiate le possibili applicazioni di tali fenomeni in talune condizioni cliniche e chirurgiche, costi' come sono considerate le possibili applicazioni terapeutiche.

SUMÁRIO

As variações glicemicas associadas com alterações de contagem dos eosinófilos foram estudadas como constituindo uma expressão hormonal adrenalinica, o proposito disso sendo avaliar os fenomenos relacionados com a função normal e anormal das glandulas adrenalinicas e a possivel aplicação destes fenomenos á certas condições clinicas e cirurgicas, como tambem estimar seu possivel valôr terapeutico.

ZUSAMMENFASSUNG

Der Verfasser untersucht die Veraenderung des Blutzuckerspiegels im Zusammenhang mit Veraenderungen der Zahl der eosinophilen Zellen im Blut als indi-

rekten Ausdruck der hormonalen Funktion der Nebenniere. Sein Ziel ist, die beobachteten Phaenomene zur normalen und pathologischen Funktion der Nebenniere in Beziehung zu bringen, die Beobachtungen auf gewisse klinische und chirurgische Krankheitszustaende anzuwenden, und—darueber hinaus—die Moeglichkeiten ihres therapeutischen Wertes abzuschaetzen.

REFERENCES

1. Barzillai, G.: Glicemia e alcalinita del sangue dopo irradiazioni coi raggi X e sostanze radioattive. Tipografia Cooperativa, Pavia, 1922.

2. Warren, S.: Arch. Path. 35:304, 1943.

3. Torgersen, O.: I Kommisjon hos Jacob Kybwad. Cited by Hartman, F. A., and Brownell, K. A.: The Adrenal Gland. Philadelphia: Lea & Febiger, 1949.

4. Engelstad, R. B., and Torgersen, O.: Acta Radiol. 18:671, 1937. Martin, C. L.; Rogers, F. T., and Fisher, N. F.: Am. J. Roentgenol. & Rad. Therapy 12:466, 1924. Grabfield, G. P., and Sgmer, T. L.: Arch. Int. Med. 27:168, 1921.

5. Desjardin, A. V.: Am. J. Roentgenol. & Rad. Therapy 19:543, 1928.

6. White, A., and Dougherty, T. F.: Federation Proc. 4:109, 1945.

7. Patt, H. M.; Swift, M. N.; Tyree, E. B., and John, E. S.: Am. J. Physiol. 150:480, 1947.

8. Ellinger, F.: Proc. Soc. Exp. Biol. & Med. 64:31, 1947.

9. Leblond, C. P., and Segal, G.: Am. J. Roentgenol. & Rad. Therapy 47:302, 1942.

10. Dresel. Cited by Barzillai, G.[1] Culpepper, W. L.; Madden, E. E.; Olson, E. C., and Hutton, J. H. H.: Endocrinology 22:236, 1938.

11. Recant, L.; Hume, D. M.; Forsham, P. H., and Thorn, G. W.: J. Clin. Endocrinol. 10:187, 1950.

12. Manzanilla, M. A., and Manzanilla, M.A. Jr.: J. Internat. Coll. Surg. 15:281, 1951. Manzanilla, M. A., and Manzanilla, M. A. Jr.: J. Internat. Coll. Surg. 15:628, 1951.

13. Boggild, D. H.: Acta Path. Microbiol. Scand. 2:68, 1925. Kuriyama, S.: J. Biol. Chem. 34:287, 1918. Artundo, A.: Compt. rend. Soc. Biol. 97:411, 1927. Wyman, L. C., and Walker, B. S.: Am. J. Physiol. 89:215, 1929. Long, C. N. H.; Katzin, B., and Fry, E. G.: Endocrinology 26:309, 1940.

14. (a) Evans, G.: Am. J. Physiol. 114:297, 1936. (b) Janes, R. G., and Friedgood, C. E.: Endocrinology 36:62, 1945.

15. Swingle, W. W.: Am. J. Physiol. 79:666, 1927. Yonkman, F. F.: Am. J. Physiol. 86:471, 1928.

16. Hartman, F. A., and Brownell, K. A.: Proc. Soc. Exp. Biol. & Med. 31:834, 1934.

17. Rogoff, J. M., and Stewart, G. N.: Am. J. Physiol. 78:683, 1926. Swingle, W. W.; Pfiffner, J. J.; Vars, H. M., and Parkins, W. M.: Am. J. Physiol. 117:13, 1936. Parkins, W. M.; Hays, H. W., and Swingle, W. W.: Am. J. Physiol. 117:13, 1936.

18. Britton, S. W.; Silvette, H., and Kline, R. F.: Am. J. Physiol. 123:705, 1938. Hartman, F. A.; MacArthur, F. G.; Gunn, F. D.; Hartman, W. E., and MacDonald, J. J. M.: Am. J. Physiol. 81:244, 1927.

19. Houssay, B. A., and Lewis, J. T.: Am. J. Physiol. 64:512, 1923. Foglia, B. G., and Gerschman, R.: Rev. Soc. Biol. Bs. As. 16:225, 1940. Ciminata, A.: Boll. Soc. Biol. Sper. 1, No. 4, 1926. Baranow, W. G.: Arch. Biol. 28:139, 1928. Turcati, E.: Compt. rend. Soc. Biol. 102:466, 1929.

20. Britton, S. W., and Silvette, H.: Am. J. Physiol. 100:701, 1932. Zwemer, R. L., and Sullivan, R. C.: Endocrinology 18:730, 1934.

21. Long, C. N. H.: Trans. & Stud. Coll. Phys. 7:21, 1939.

22. Lukens, F. D. W., and Dohan, F. C.: Endocrinology 22:51, 1938. Long.[21]

23. Soffer, L. J.: Diseases of the Adrenals. Philadelphia: Lea & Febiger, 1948.

24. Ingle, D. J., and Thorn, G. W.: Am. J. Physiol. 132:670, 1941. Forsham, P. H.; Thorn, G. W.; Bergner, G. E., and Emerson, K. Jr.: Am. J. Med. 1:105, 1946. Soffer.[23]

25. Thorn, G. W.; Bayles, T. B.; Massell, B. F.; Forsham, P. H.; Hill, S. R. Jr.; Smith, S., and Warren, J. E.: New England J. Med. 241: 529, 1949.

26. Thorn, G. W.; Koepf, G. F.; Lewis, R. A., and Olsen, E. F.: J. Clin. Invest. 19:813, 1940. Lukens, F. D. W.: In Soskin, S.: Progress in Clinical Endocrinology. New York: Grune & Stratton, 1950.

27. Venning, E. H., and Browne, J. S.: J. Clin. Endocrinol. 7:79, 1947.

28. Lukens, F. D. W.; Flippen, H. F., and Thigpen, F. M.: Am. J. Med. Sci. 193:812, 1937. Kepler, E. J., and Wilder, R. M.: Acta Med. Scand. 90:87, 1938. Shepardson, H. C., and Shapiro, E.: Endocrinology 24:237, 1939. Levine, R., and Weisberg, H. F.: In Soskin, S.: Progress in Clinical Endocrinology. New York: Grune & Stratton, 1950.

29. Thorn, G. W.; Forsham, P. H.; Bennett, L. L.; Roche, M.; Reiss, R. S.; Slessor, A.; Flink, E. B., and Somerville, W.: Trans. Assoc. Am. Phis. 62:233, 1949.

30. Crampton, J. H.; Snidder, S. T., and Davis, C. D.: J. Clin. Endocrinol. 9:245, 1949. Simpson, S. L.: J. Clin. Endocrinol. 9:403, 1949. Devitt, J. S., and Murphy, F. C.: Am. J. Digest. Dis. 14:164, 1947. Rhind, E. G. G., and Wilson, A.: Lancet 2:37, 1941. McCullagh, E. P.: Cleveland Clin. Quart. 9:123, 1942. Bloomfield, A. L.: Bull. Johns Hopkins Hosp. 65:456, 1939. Thorn, G. W., and Cinton, M. Jr.: J. Clin. Endocrinol. 3:335, 1943.

31. Emmerson, W.; Parkin, T. W., and Howell, L. P.: Proc. Staff Meet. Mayo Clin. 25:145, 1950.

32. Manzanilla, M. A., and Manzanilla, M. A. Jr.: J. Internat. Coll. Surg. 13:651, 1950; Cir. y Cir. 18:269, 1950.

33. Dalton, A. J., and Selye, H.: Folia Haemat. 62:397, 1939.

34. Hills, A. G.; Forsham, P. H., and Finch, C. A.: J. Hemat. 3:755, 1948.

35. Thorn, G. W.; Forsham; P. H., Prunty, F. T.; Bergner, R. C., and Hills, A. G.: Ann. New York Acad. Sci. 50:646, 1949. Herbert, P. H., and de Vries, J. A.: Endocrinology 44:239, 1949. Elkinton, J. R.; Hunt, A. D. Jr.; Godfrey,

L.; McCrory, W. W.; Rogerson, A. C., and Stokes, D.: J. A. M. A. 141:1273, 1949. Recant et al.[11] Thorn et al.[29]

36. Vennig, E. H., and Browne, J. S. L.: In Soskin, S.: Progress in Clinical Endocrinology. New York: Grune & Stratton, 1950.

37. (a) Lewis, L. A.: Endocrinology 28:821, 1941. (b) Thorn, G. W., and Forsham, P. H.: In Williams, R. B.: Textbook of Endocrinology. Philadelphia: W. B. Saunders Co., 1950.

38. Forsham, P. H.; Thorn, G. W.; Prunty, F. T. G., and Hills, A. G.: J. Clin. Endocrinol. 8:15, 1948.

39. Speirs, R. S., and Meyer, R. K.: Endocrinology 45:403, 1949.

40. Drury, A.: Am. J. Physiol. 160:75, 1950. Vogt, M. J.: J. Physiol. 103:314, 1944. Vogt, M. J.: J. Physiol. 106:394, 1947. Long, C. N. H.: Bull. New York Acad. Med. 23:260, 1947.

41. Almy, T. P., and Laragh, J. H.: Am. J. Med. 6:507, 1949. Godlowski, Z. Z.: Brit. Med. J. 1:46, 1948. Hortling, H., and Pekkarinen, A.: Acta Endocrinol. 2:356, 1949.

42. Del Castillo, E. B.; Copello, R. S., and Jauregui, G. R.: La Sem. Med. 57:1053, 1950.

43. Folin, O., and Wu, H.: J. Biol. Chem. 41: 367, 1920.

44. Thorn, G. W., and Forsham, P. H. In Soskin, S.: Progress in Clinical Endocrinology. New York: Grune & Stratton, 1950.

45. (a) Herrick, J. F., and Mann, F. C.: Am. J. Physiol. 124:558, 1938. (b) Cannon, W. B.: La sabiduría del Cuerpo. Seneca, México, 1941. (c) Drury, D. R.: J. Clin. Endocrinol. 2:421, 1942. (d) Soskin, S.: Clinics 1:1286, 1943.

46. Talbot, N. B.; Albright, F.; Soltzman, A. H.; Zygmuntowicz, A., and Wixom, R.: J. Clin. Endocrinol. 7:331, 1947.

47. Thorn, G. W., and Forsham, P. H.: Recent Advances in Hormone Research (to be published). Cited by Thorn, G. W.; Bayles, T. B.; Massell, B. F.; Forsham, P. H.; Hill, R. S. Jr.; Smith, S., and Warren, J. E.[44]

The United States Chapter of the International College of Surgeons

announces the creation of Junior Membership in the College. The House of Delegates, meeting on Dec. 18, 1949, established this new form of membership, with the following requirements:

One year of internship in an approved hospital

One year as resident surgeon in a specific surgical training program

For further information, address

Secretary, International Board of Surgery

1516 Lake Shore Drive Chicago 10, Ill.

Drainage of the Infected Peritoneal Cavity

ANTON P. RANDAZZO, M.D., C.M., F.I.C.S.,* AND EMIL DUL, M.D.**
PASSAIC, NEW JERSEY

DRAINAGE of the infected peritoneal cavity has long been a topic for discussion and investigation. As a result, means have been devised to drain the abdomen for general peritonitis, local peritonitis or local abscess. Up to the present time, however, no particular method meets the requirements for satisfactory performance, under different circumstances or even in identical cases.

During the past decade Steadman, Ritter, McCarthy, McCrea and others have designed and used apparatus for positive suction to evacuate the bladder. Babcock designed and perfected the stainless steel sump drain for intraperitoneal drainage in his perineal colostomies. Burnett used the sump drain in his peritoneal infections. Most of Burnett's cases were concerned with soiling of the peritoneum due to visible rupture of the appendix. However, throughout the years the basic principle of positive suction has remained in use in spite of various modifications and improvements on the sump drain.

About two years ago we began to use irrigation combined with positive suction, and the following report gives the results of our experience with this modification under a variety of circumstances.

In offering this article we have a twofold purpose: (1) to encourage practitioners who have not tried it to use this method of drainage; (2) to stimulate surgeons in general to review their own use of the drain and to revise, improve, adapt and experiment, with a view toward developing the ideal method of handling the problem of drainage, which is always with the surgeon. Even while this article is being prepared we are experimenting with plastic drains in the hope that they will prove to be more innocuous than vitallium.

Regardless of the outcome of the aforementioned change, we are gratified as surgeons with the results of our experiments, and—what is even more important—they have proved a blessing to the patients. The surgeon's prime concern is to make sure that when he has corrected a pathologic condition the patient will suffer the least possible after-effects. The stormy convalescence, the fascial necrosis, the postoperative hernias, etc., which so often follow the use of gauze, the Penrose rubber tube, the hard rubber tube, or the cigarette drain are all too well known. With these drains, the drainage is accomplished primarily by overflow, the drains themselves serving to guide the exudate to the outside dressing. However, even when they effect drainage, the accompanying disadvantages often outweight the advantages. Gauze drains usually block drainage unless there is a thin exudate. Hard rubber drains are irritants. Other drains may occasionally produce adequate results, but the mechanical factors of irritation and plugging, with the resulting slight drainage, result in such morbid conditions as intractable adhesions, fistulas or postoperative obstructions. Added to these is the lengthened postoperative hospitalization.

It must be said that our drain has certain disadvantages. Since it is made of rubber, it causes some irritation, although considerably less than other drains do. This is perhaps due to the actual composition of the rubber tubing itself, together with the shorter time the drain is left in position, and the irrigation. The mechanics of this drain are comparatively simple, as an examination of the list of parts and the pictured assembled apparatus will show, but they must be understood by attending nurses and interns as well as by

*Senior Attending Surgeon, Passaic General Hospital.
**Assistant Surgeon, Passaic General Hospital.
Submitted for publication April 2, 1951.

the surgeon if the drain is to operate efficiently and the optimum results are to be obtained. Common sense must guide the surgeon in judging the amount and type of exudate and the regulation of the amount of irrigation.

Apparatus.—1. The U-shaped tube, 9½ inches (23.7 cm.) long, is cemented together from the tip to about 5½ inches (13.7 cm.) from the top, thus leaving two free limbs at the top to allow suturing of the skin between them in order to hold it in position. At the tip each limb is sealed off from the other. The tubing itself is of pure gum, made from selected fine pale crepe containing none of the customary rubber fillers. Naturally, the exact proportions of the ingredients used are patented by the manufacturer. It has been vulcanized with sulphur and accelerated with and organic accelerator, which is facilitated with some amount of zinc oxide and a fatty acid. The outer walls have been perforated at intervals of about ¾ inch (1.9 cm.) for a distance of about 3 inches (7.5 cm.)

2. A regular intravenous set-up (to be used for irrigation).

3. A thermotic drainage pump (Gomco).

Technic. — Intermittent vacuum pressure suction is created by a thermotic drainage pump. This applies 5 seconds of gentle suction (90 to 120 mm. of mercury) in every twenty seconds. The intermittent suction allows a pool of solution with exudate to be formed in the rest period. Through the other tube, either continuously or intermittently, whichever the circumstances indicate, physiologic solution of sodium chloride containing 200,000 units of penicillin per liter is dropped at the rate of 40 drops or less per minute. This bathes the area and thins out the exudate. There is not enough irrigation pressure to disseminate infection. The exudate is now more easily removed with its toxins, living bacteria and necrotic tissue. The neighboring bowel is kept floating, thus reducing the danger of adhesions or fistulas or the accumulation of exudate in a dead space. In addition, the type of exudate e.g., hemorrhage is easily visible. If the flow of the irrigating fluid is too rapid, the dressing will become saturated owing to the lack of balance between inflow and outflow. If there is no return from the suction, the inflow of fluid should be reduced to 20 drops or less; or both inflow and suction should be interrupted, say for an hour, after which each successive interval may be lengthened or shortened according to the return of the suction. To prevent particles of thick exudate from adhering to the openings of the drain and thus plugging the suction side, the connections are reversed approximately every twenty-four hours; i.e., the drip is then placed on the suction limb of the drain and the suction line is attached to the drip limb. In order to keep the tubes erect, they are either splinted (with pieces of tongue depressors) or covered by a small cradle above the dressing.

In the case of an abscess the drain is placed in the center and as deeply as possible. In other types of infection, the placing of the drain is best determined by the surgeon as befits the individual case. However, the peritoneum and the fascia must be sutured snugly around the drain and the drain itself is held in place by a suture (silk or wire) through the skin between the two limbs of the drain. In addition, strips of adhesive tape from the splints on the limbs are made fast to the adhesive tape of the dressing. The tubes can be sterilized by pressure sterilizers and re-used as often as desired, but they should be checked carefully for débris and patency of the perforations before autoclaving.

Results.—The results have been gratifying, even though the number of cases is limited. After two years of experience, there have been no wound infections up to the time of writing. There has been only 1 hernia (ventral), which was in no way attributable to the drain but was due primarily to tissue digestion in a case of acute necrotizing pancreatitis with hemo-

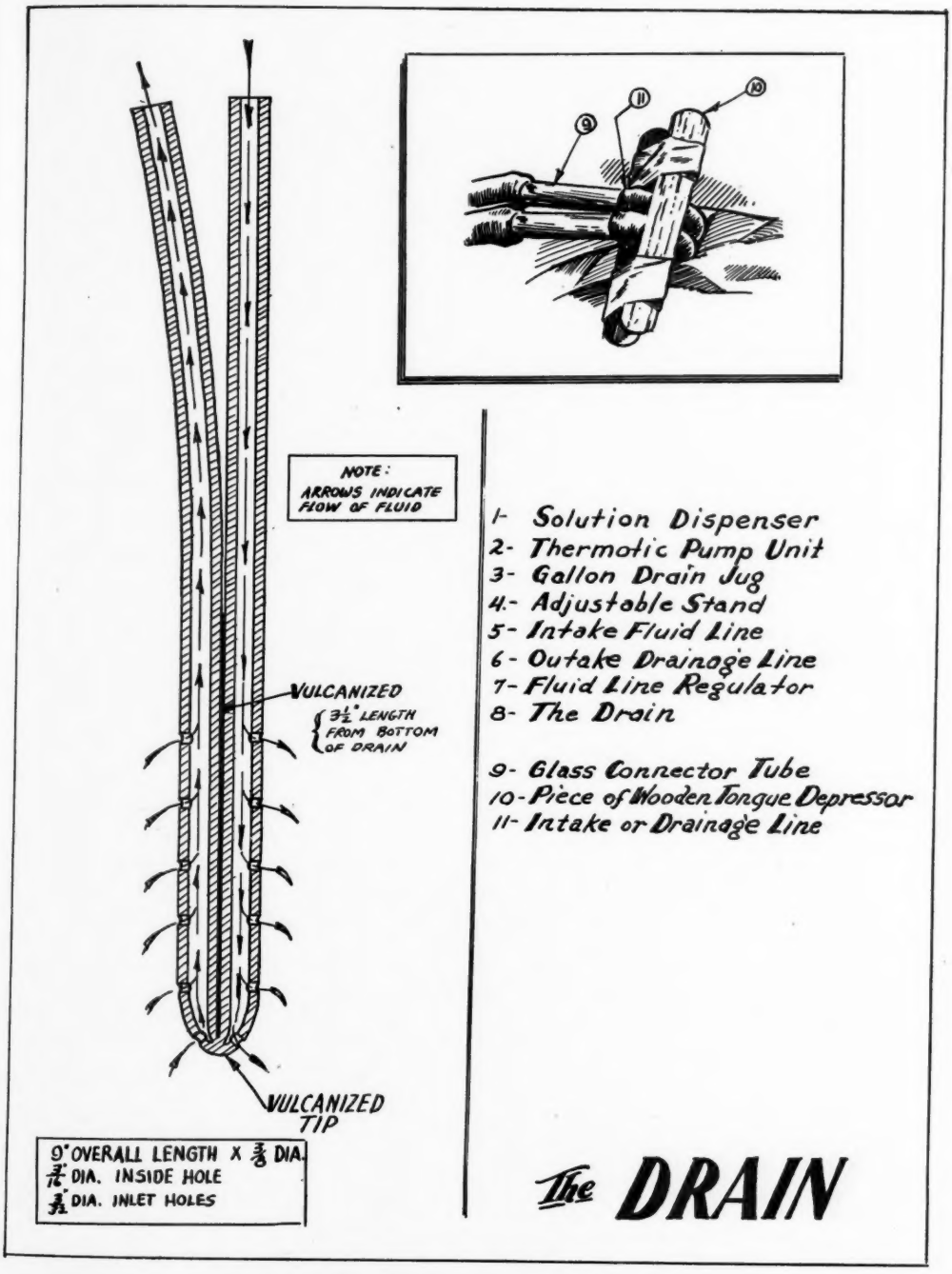


Fig. 1.—Diagrammatic representation of drain.

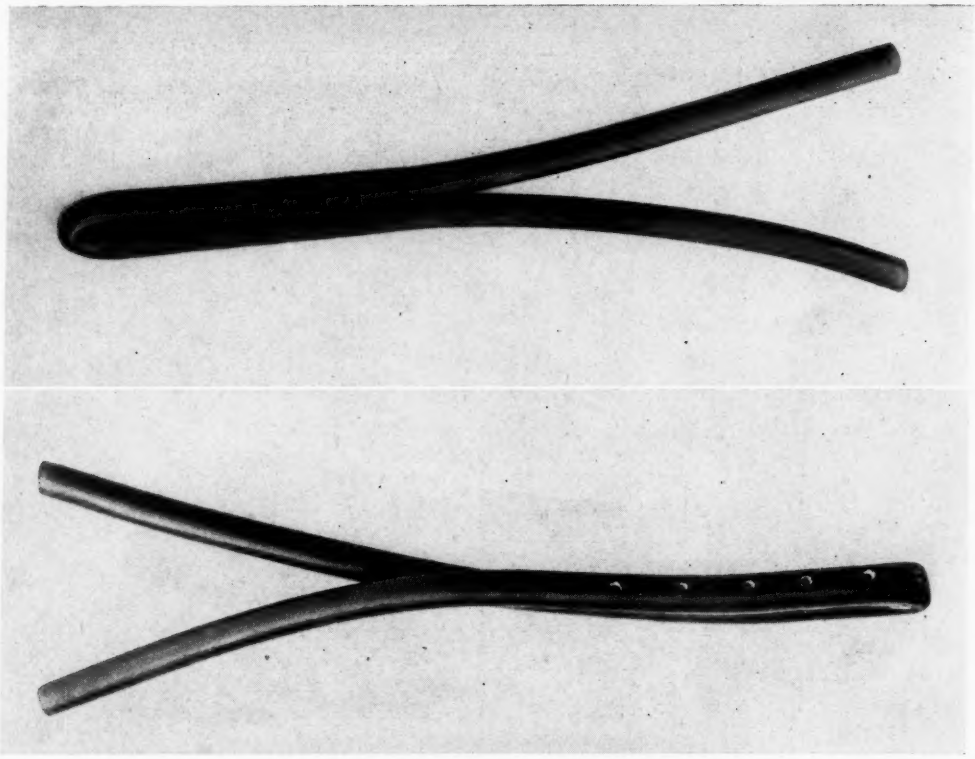


Fig. 2.—Photographs of drain (actual length, 9 inches).

purulent peritonitis. A diagnosis of perforated ulcer was made, as the patient had been under treatment for some time for a chronic gastric ulcer before being referred for surgical treatment. It was only postoperatively that we learned that the patient's gastrointestinal symptoms followed an accident a year earlier, when he was struck in the abdomen by a steering wheel. In this case a drain was placed through the gastrohepatic ligament into the defect caused by a biopsy in a pancreatic mass that extended upward into the diaphram. The gastrohepatic ligament and the skin were sutured between the arms of the drain as has been described. At the time this was done, a digestion of the tissue had already begun, owing to the action of the pancreatic enzymes. It is our opinion that insertion of the drain, with irrigation, caused dilution of the enzymes, and that the positive suction helped to remove considerable amounts of these enzymes quickly, before they could attack the tissues. When the patient left the hospital four weeks later he had an incisional hernia, but he might well have lost his life.

The following list will show the wide variety of conditions in which the drain was used, including those associated with varying degrees of infection. In addition to the case of acute necrotizing pancreatitis, which we have just discussed, there were:

23 cases of visibly ruptured appendix with appendical abscesses or general peritonitis

2 cases of fecal contamination of the peritoneal cavity caused by a blowout

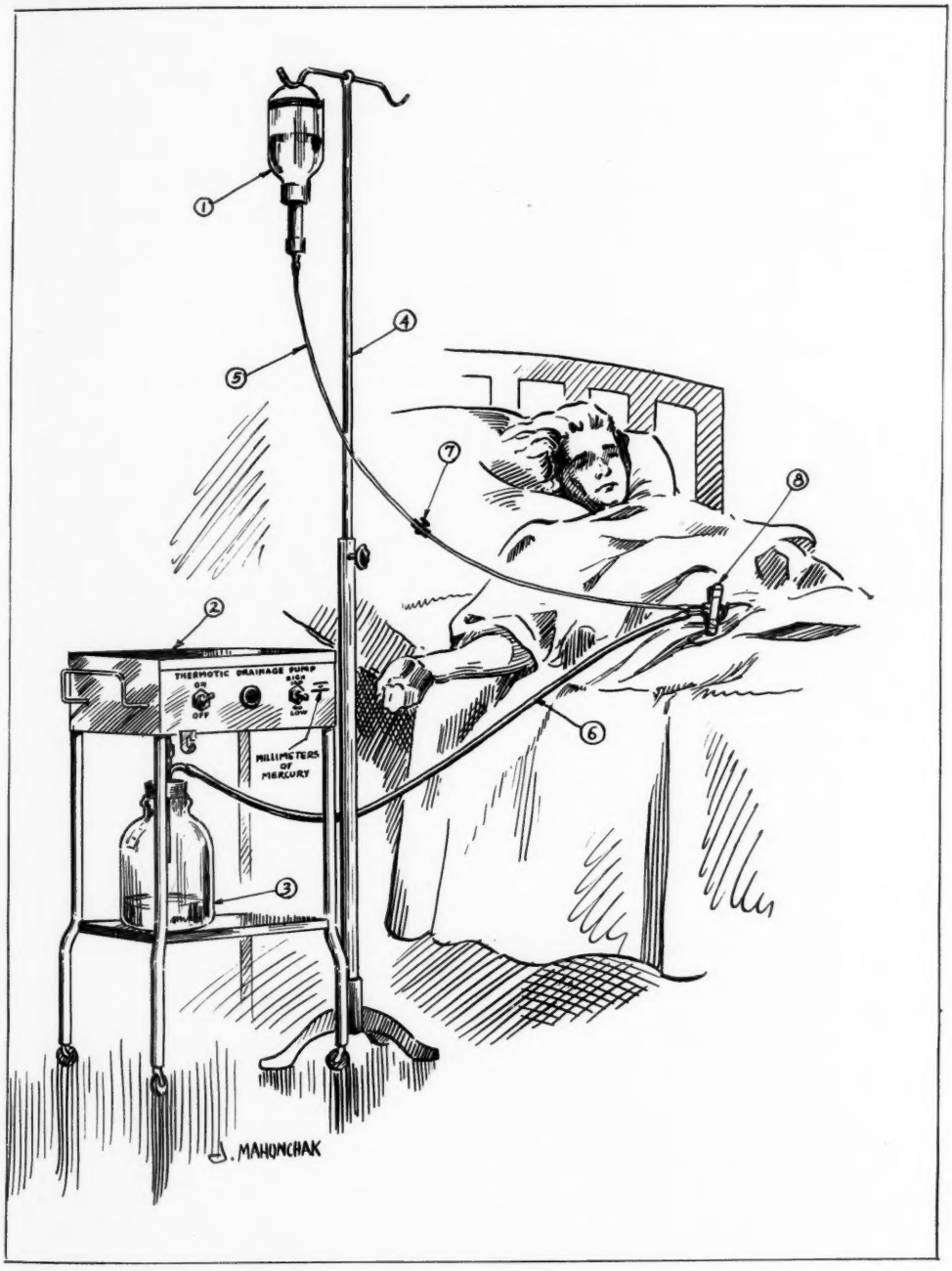


Fig. 3.—Drain in use. Key numbers are explained in Figure 1.

Fig. 4.—Patient with general peritonitis. Drain in function, together with continuous intravenous drip and decompression of bowel.

at the site of a carcinoma of the large bowel

3 cases of ruptured gallbladder

1 case of large abscess due to a ruptured diverticulum

4 cases of postappendectomy complications in which the stump blew out, with resultant hemopurulent fecal peritonitis

3 cases of ruptured tubo-ovarian abscess

1 case of traumatic rupture of the intestine (the bowel was completely severed)

1 case in which we had occasion to use the drain for an appendical abscess and six months later to use it again for an abscess caused by soiling at the site of a spontaneous cholecystocolic fistula.

Since we had used the drain at the time of the first operation, we took particular note of the condition of the abdominal cavity when we opened it the second time. We are happy to report the presence of a negligible number of adhesions.

All the aforementioned patients received antibiotics: penicillin, aureomycin, chloromycetin or terramycin, together with continuous intravenous feedings and transfusions. Various vitamins, such as B, C and K, and last but not least, decompression, were employed when indicated.

We believe that satisfactory results could be obtained by using this drain in the treatment of other conditions:

Drainage of the chest in thoracic surgery
Perinephritic abscesses
Subdiaphragmatic abscesses
Any accessible empyema
Radical mastectomies
Peritonitis following Caesarean sections

SUMMARY AND CONCLUSIONS

A modified method of drainage, in which the principles of irrigation and positive suction are employed, is presented. We readily admit that the method is far from perfect, but it has served us well to date. We have had no deaths. The hospital stay has been prolonged only a few days longer than that of noninfected patients. The hospital convalescence in no case was stormy. There were no infected wounds. There was only 1 hernia, a ventral one, not attributable to the method of drainage. We have demonstrated the use of this drain in a wide variety of cases in which there was considerable variation in the degree of infection.

In conclusion, therefore, we feel that even though the actual number of cases has been comparatively small, the satisfying results indicate that this method deserves further and continued use in the handling of similar cases.

RÉSUMÉ ET CONCLUSIONS

On y discute un procédé simple de drainage où l'on se sert des principes de l'irrigation continue et de la succion positive. Même si la méthode n'est pas parfaite, elle a rendu de bons services

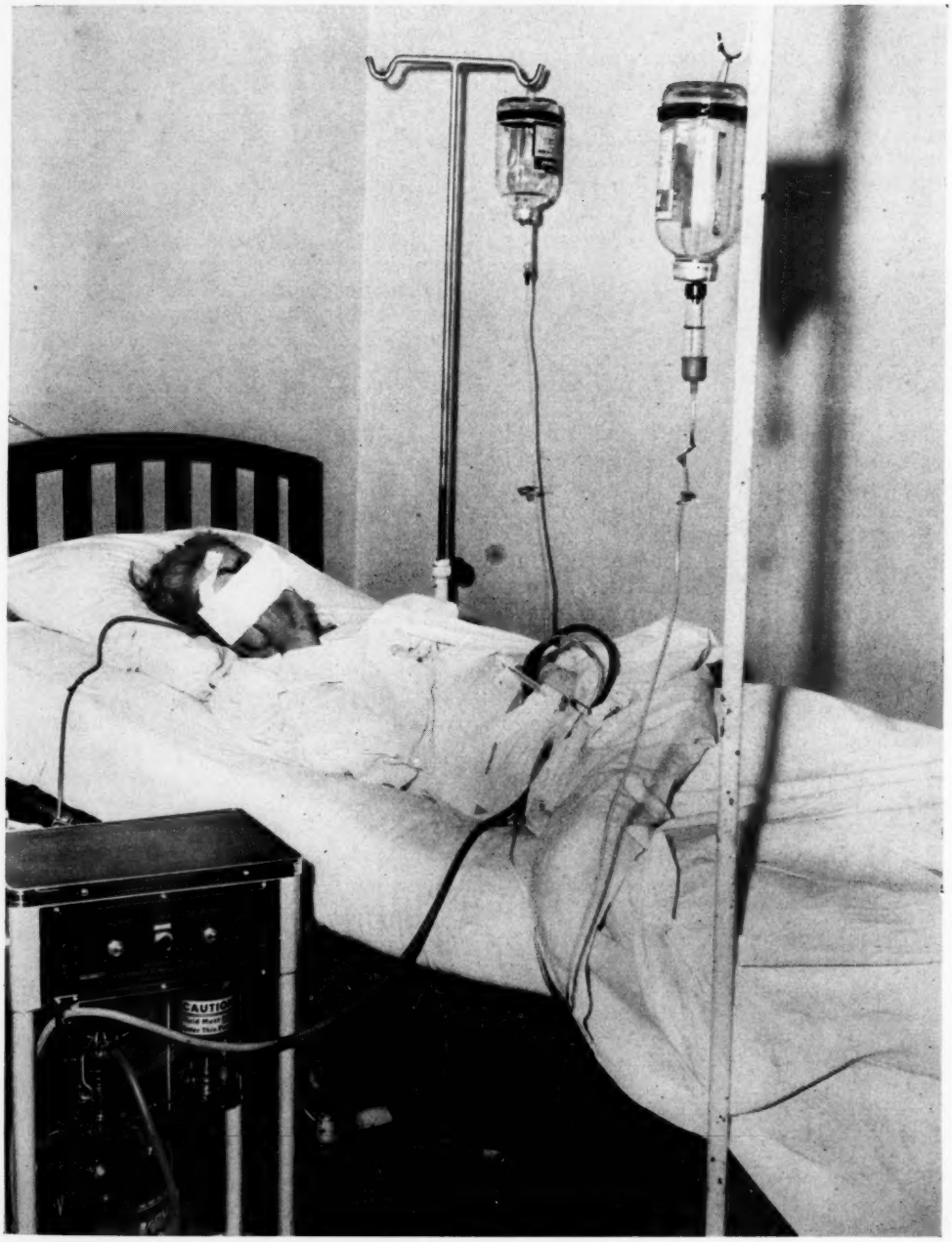


Fig. 5.—Drain in use in a case of general peritonitis complicating ruptured gangrenous appendicitis.

jusqu'à présent. Il n'y eût aucune mortalité et le séjour hospitalier presque comparable à celui des cas non infectés. Sans épisode orageux, sans infection, avec une seule hernie ventrale. Une discussion impartiale du cas semble exonérer la méthode. La méthode est employée dans une grande variété de cas infectés. Même si le nombre de malades traités est encore peu considérable, le procédé est satisfaisant et doit être encouragé.

RESUMEN Y CONCLUSIONES

Se discute un método de canalización modificado, en que han sido usados los principios de irrigación y succión positiva. Se admite desde luego que el método dista de ser perfecto, aun cuando ha sido de utilidad hasta ahora. No ha habido decesos. Permanencia en el hospital prolongada sólo unos cuantos días en casos no infectados. Convalescencia sin trastornos. Ninguna herida infectada. Hubo hernia ventral en un solo caso, que se estima no puede atribuirse al método de canalización. Se considera haberse demostrado el uso de esta canalización en amplia variedad de casos, en los que hubo variación considerable en el grado de infección.

Se concluye que, aun cuando el número actual de casos es comparativamente pequeño, los resultados satisfactorios indican que el uso de este método es prometedor en dichos tipos de casos.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Es wird eine modifizierte Form der Drainierung eroertert, bei der die Prinzipien der Irrigation und der positiven Ansaugung zur Anwendung gelangen. Wenn auch die Methode, wie gern zugegeben wird, noch keineswegs perfekt ist, so hat sie doch bisher gute Dienste geleistet. Todesfaelle sind nicht vorgekommen. Der Krankenhausaufenthalt dauerte nur wenige Tage laenger als bei nichtinfizierten Faellen. Der Heilungsverlauf im Krankenhaus war in keinem Fall ein stuermischer. Infektion von Wunden kam nicht vor. Nur eine einzige Hernie, ein Bauchwandbruch, kam zur Beobachtung. Die Diskussion dieses Falles ergab, dass er nicht auf die Methode der Drainierung zurueckgefuerht werden kann. Das Verfahren ist an einer Reihe von sehr verschiedenartigen Faellen, die betraechtliche Unterschiede im Grade der Infektion aufwiesen, angewandt worden.

Es wird geschlossen, dass die befriedigenden Resultate, wenn auch das Krankenmaterial verhaeltnismaessig gering war, zur weiteren Anwendung in der Behandlung solcher Faelle berechtigen.

RIASSUNTO E CONCLUSIONI

Viene discusso un nuovo metodo di drenaggio in cui sono impiegati i principi di irrigazione e di aspirazione. Il metodo é ben lungi dall'essere perfetto, per quanto fino a questo momento abbia servito egregiamente. Noi non abbiamo avuto decessi. L'ospitalizzazione é stata soltanto di pochi giorni più lunga di quella dei casi non infetti. La convalescenza non é stata burrascosa in alcun caso. Non ci sono stati casi di infezione della ferita. C'é stata soltanto un'ernia ventrale, ma la disamina di questo caso rivela che che esso alla rigore non va attribuito al metodo di drenaggio. Noi abbiamo dimostrato l'uso di questo drenaggio in un'ampia varietà di casi che presentavano una considerevole gamma di gradi d'infezione.

Perciò in conclusione, noi riteniamo che, per quanto il numero dei casi sia stato relativamente limitato, i soddisfacenti risultati indicano che il metodo merita ulteriore e continuo uso nel trattamento dei casi di questo genere.

SUMÁRIO E CONCLUSÕES

Um método modificado de drenagem é discutido, no qual os principios de irrigação e de sucção positiva foram usados. E' facilmente admitido que o método está longe de ser perfeito, ainda que tenha sido de grande utilidade para os autôres até

o presente. Não se registraram mortes. A estadia no hospital se prolongou somente uns poucos dias mais do que nos casos não infetados. A convalescença hospitalar em nenhum caso foi tempestuósa. Não houve feridas infetadas. Houve somente uma hernia do tipo ventral. A discussão deste caso indicou que ela não póde ser verdadeiramente atribuida ao método de drenagem. Os autôres demonstraram o uso dessa drenagem numa larga variedade de casos, apresentando consideravel variação no grau da infeção.

Concluindo, os autôres acreditam que o atual numero de casos tem sido comparativamente pequeno, os resultados satisfatórios indicando que este método merece ulterior e continuado uso no manuseio desse tipo de casos.

REFERENCES

1. Babcock, W. W.: Spreading Peritonitis: Its Prevention and Treatment. Pennsylvania M. J. 43:1093-1099, 1940.

2. Burnett, W. E.; Rosemond, G. P., and Caswell, H. T.: The Use of the Sump Drain in Peritoneal Infection Surg. Clin. North America 24: 1316-1325, 1944.

3. McCrea, L. E.: Sump Drainage in Surgical Management of Prostatectomy. J. Internat. Col. Surg. 10:394-397, 1947.

Echoes of the Past

XII. SPECIALISTS IN ANCIENT ROME

The knowledge that medical specialists existed in ancient Rome is gleaned from the literature of such great classic writers as Cicero and Martial. Cicero wrote of specialists in internal diseases, wounds and eye diseases. Other types of specialists are described by him. Some physicians achieved fame as specialists. The great ophthalmologist, Demosthenes, practiced in the reign of Nero. His work was admired greatly by Pope Sylvester II (999-1055) and was still in existence during the fourteenth century.

Martial (45-102 A. D.) satirized the overspecialization of the day: "Cascellus extracts or fills an aching tooth, Hyginus burns away disfiguring hairs; Fannius relieves, without cutting, the relaxed uvula; Eros effaces the degrading brand-marks from freedman's foreheads; Podaliruis is an expert in curing a hernia; but tell me, Gaelus, where is he that can help my harassed person?"

In his *De Medicina V*, Celsus gave advice to specialists which is still appropriate and deserving of quotation:

"Now the physician ought to be able to distinguish what are incurable, and what are easy of cure. For, in the first place, a wise man will not meddle with a patient whose recovery is impossible; nor take upon himself the odium of having killed one, whom his own destiny has carried off. And in the next place, when the case is very dangerous, although not completely hopeless, he will reasonably inform the patient's friends that the difficulty is considerable; lest in the event of the malady prevailing over art, he may appear to be ignorant, or to have practiced a deception. But although this is a line of conduct worthy of a prudent man, so, on the other hand, to give undue importance to a trivial case, that one may seem to have accomplished wonders, is to play the part of a mountebank. It is but just that our acknowledgment of the simplicity of a case should act as a stimulus to circumspection, lest that which is trivial become serious through the neglect of the medical attendant."

—Bernard J. Ficarra, M.D., F.I.C.S.

Case Report

Diffuse Gastric Polyposis

ALBIN J. SOWKA, M.D.* AND EDWARD H. WARSZEWSKI, M.D., F.A.C.S., F.I.C.S.**
CHICAGO

GASTRIC polyposis is still a confusing subject, although much has been written about it. No confusion has resulted, however, when only one such tumor existed in the stomach. It has been universally termed a polyp, sometimes described as adenomatous. Whenever more than two or three polyps have been found, further confusion in nomenclature has resulted. This confusion is primarily caused by the fact that more than one pathologic entity has been grouped to-

*Associate Surgical Staff, St. Mary of Nazareth Hospital, Chicago.
**Chief of Staff, St. Mary of Nazareth Hospital, Chicago.
From the Department of Surgery, St. Mary of Nazareth Hospital, Chicago.
Submitted for publication May 27, 1951.

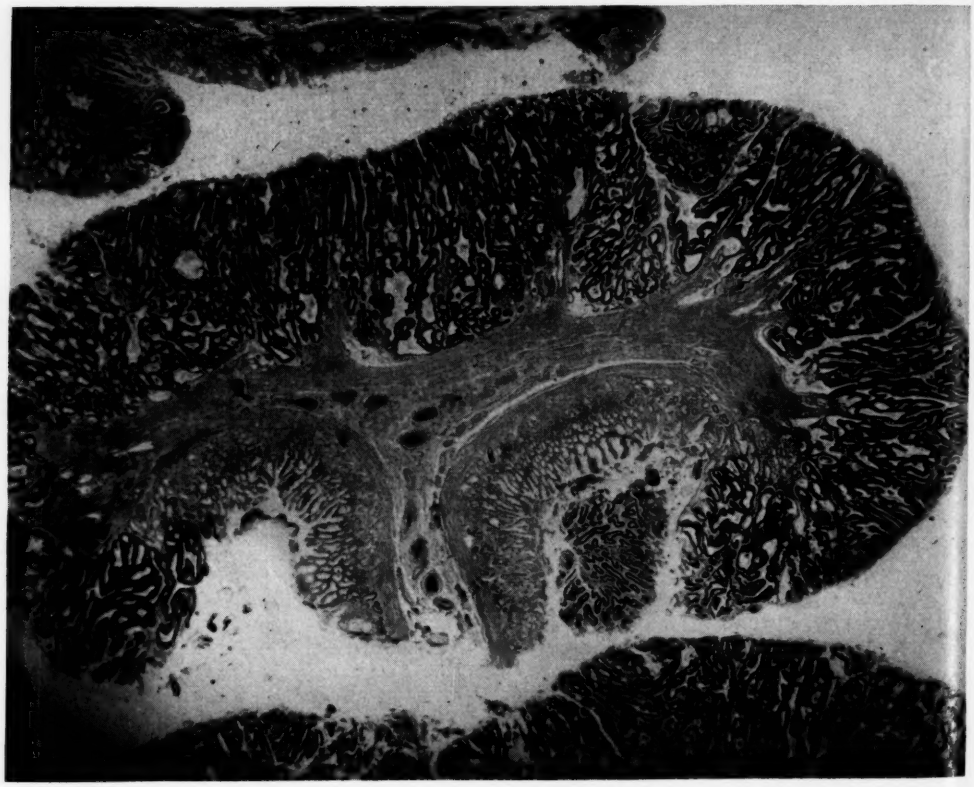


Fig. 1.—Microscopic appearance of a discrete, pedunculated polyp (×5). Mucosa is markedly thickened and covers a core of connective tissue that pushes the muscularis mucosa before it.

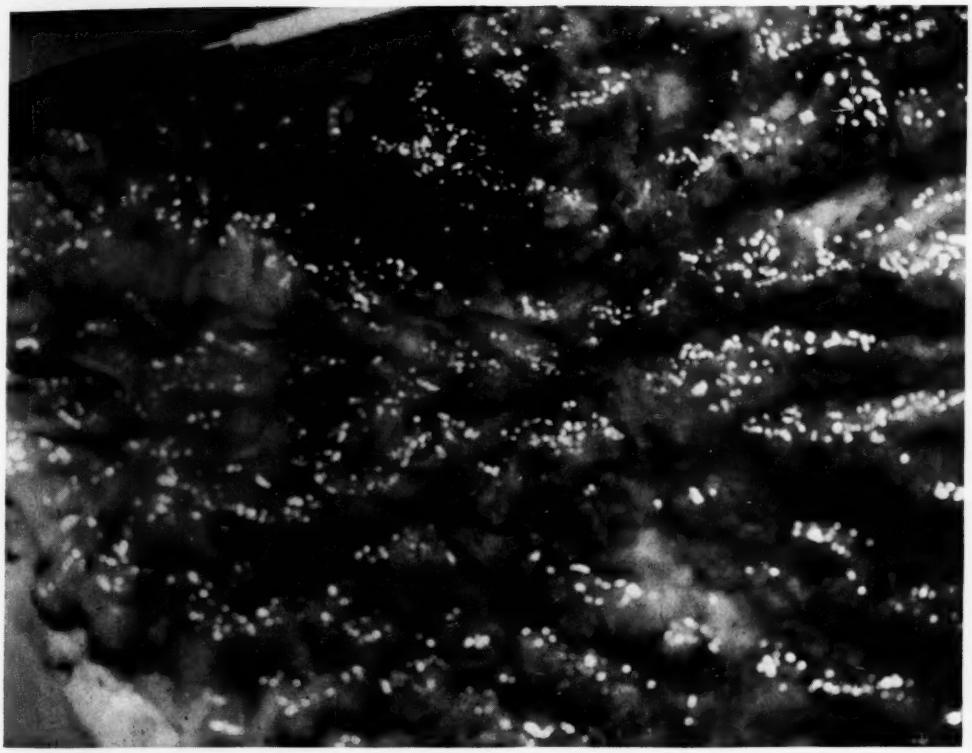


Fig. 2.—Gross appearance of mucosal surface of stomach, showing cerebrum-like convolutions of mucus-covered rugae.

gether under the same physically descriptive term, polyposis.

This condition has also been known as adenomatosis g a s t r i c a, papillomatosis gastrica, polyposis adenomatosis, and adenopapillomatosis. Brissaud was the first to classify it under the term polyadenoma, and Menetrier, in 1888, expanded this term to describe the two main types of polyps seen by him, namely polyadenoma polypeaux and polyadenoma *en nappe*.

The diffuse type of polyposis, which is the subject of this paper, is known as polyadenoma *en nappe* and is composed of closely placed folds of hypertrophic mucous membrane resembling the convolutions of the brain. The enlargement which forms the "polyp" is composed of a purely mucosal proliferation in which the epithelial and the fibrous components both play a part. The glands increase in height, remaining almost entirely in a straight line, and they reach unusual proportions of five or six times their normal length. The stroma of the mucosa is generally a little thickened and stretched out like the glands (Pearl and Brunn). The muscularis mucosa is always intact, and the submucosa makes no attempt to insinuate itself into the hyperplastic area.

Discrete polyps (polyadenoma polypeaux) are of a different description. Discrete polyps are usually soft, lobulated outgrowths with great variation in size. Some are pedunculated and some are broad at the base. Section shows the tumor to consist of a marked thickening

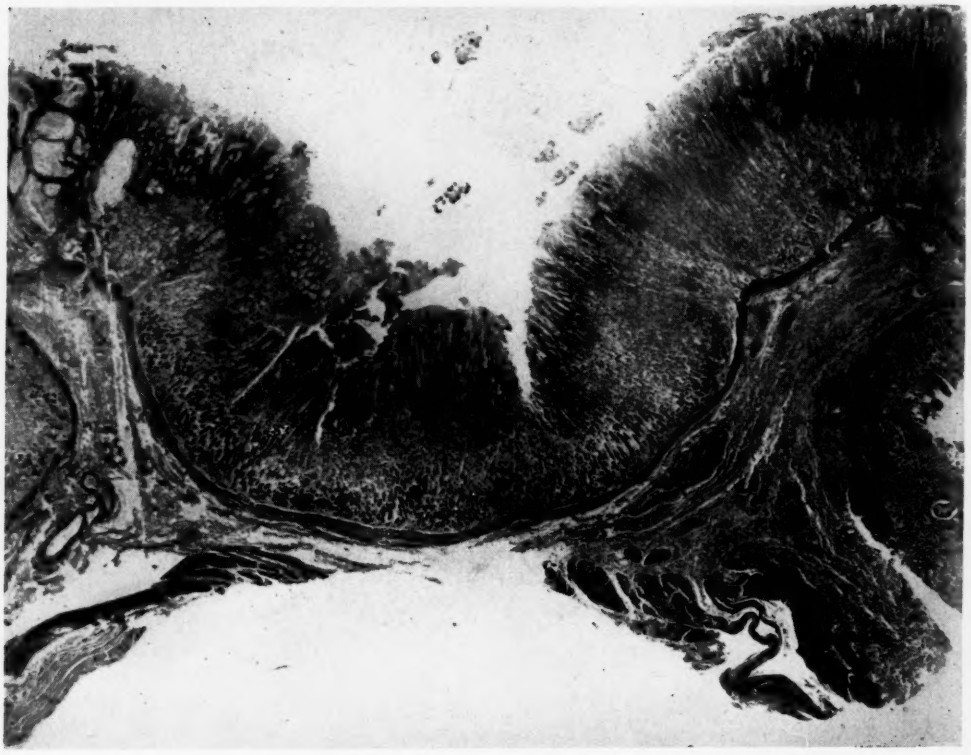


Fig. 3.—Microscopic appearance of diffuse gastric polyposis (× 5). Muscularis mucosa shown as intact layer separating hypertrophied mucosa from submucosal stalks.

of the mucosa with a cone of connective tissue pushing itself upward from the submucosa and splitting the muscularis mucosa before it.

Microscopic differentiation of these two polyps shows the diffuse type to possess relatively normal epithelial cells which multiply to form hypertrophied glands, whereas the discrete type has cells which often show premalignant changes. The cells of a discrete polyp often grow in a disorderly fashion, showing evidence of hyperchromia and, occasionally, mitoses (Fig. 1).

Gastric polyposis is an uncommon condition, only about 142 cases having been reported in medical literature. The reported autopsy incidence of this condition is 0.4 per cent. However, diffuse polyposis is by far the more rare of the two types, since only 9 of the cases reported can justifiably be considered of this type. Eusterman and Sentry believe this to be the rarest form of benign tumor of the stomach. In addition, the authors wish to present their own case of diffuse polyposis to add to the literature.

REPORT OF CASE

The patient, a slender white man aged 34, worked as a bank clerk. He was in good health until six months before admission to the hospital. At this time the patient noticed that he tired easily and that his appetite was poor. Soon he began to experience abdominal cramps which came on before, during and after meals as dull aching pain in the epigastrium. During some of these dull

Fig. 4.—Higher magnification of a polyp, showing autolysis of cells, cystic dilatation of mucus-filled glands and edematous connective tissue (× 30).

cramping pains the patient vomited, and within a few months he had lost 20 pounds.

Physical examination revealed the patient to be well developed and poorly nourished. He also appeared to be chronically ill. His abdomen was scaphoid and presented a mild degree of tenderness over the epigastrium. No obvious masses were palpable.

Roentgenograms were taken which revealed a large filling defect involving the middle and distal portions of the stomach.

Gastric analysis revealed a low total acidity level and an no free acids. Coffee-ground blood was found in the gastric specimen.

A total gastrectomy was performed with a jejunoesophageal anastomosis after a gastrotomy had been done to evaluate the lesion. The patient was given multiple blood transfusions, intravenous fluids, tube feedings and then a graduated diet of soft foods. The soft frequent feedings were high in protein and low in fat and were supplemented with capsules containing liver and powdered stomach extract.

The pathologic report (Eric Thurston, M.D.) was as follows: "The gross specimen consisted of the stomach and a portion of the duodenum measuring 22 cm. along the lesser curvature and weighing about 1,800 Gm. empty. The open stomach showed the rugae thrown up into thick heavy folds measuring as much as 1.5 cm. in width and 1 cm. in thickness, with the mucosa involved from the esophagus to the pylorus. The mucosal surface was congested and covered with thick, slimy mucus" (Fig. 2). "The regional lymph nodes were greatly enlarged and were light grey."

The microscopic report was as follows: "Blocks removed from various areas of the stomach showed the mucosa to have been thrown into folds of extreme thickness of a

polypoid arrangement. These polyps have a broad base and stalk, but the bulk of the polyp is formed from the hypertrophied mucosa" (Fig. 3). "While considerable autolysis of the chief and parietal cells was presented, there was also an apparent increase in the number of mucous neck cells in certain areas. In other areas there was a cystic dilatation of the mucous-filled gastric glands. Fine connective tissue strands separated the glands of the polyp, thereby giving a fan-shaped appearance. There was no evidence of inflammatory cells in the connective tissue of the mucosa. The muscularis mucosa followed the base of the mucosa into the polyp, but remained intact throughout. The submucosal connective tissue was considerably increased and appeared edematous, but there was no indication of inflammatory cell infiltration. The muscularis propria was somewhat thinner than normal, thus reflecting the amount of dilation present" (Fig. 4).

The diagnotic report was "diffuse polyposis adenomatosis (*en nappe*)."

SUMMARY

A rare case of diffuse gastric polyposis has been presented, and an attempt has been made to differentiate this type from the more common discrete gastric polypi. Pathologic criteria for differentiation have been discussed and illustrations given.

RESUMEN

Se comunica un caso raro de poliposis gástrica difusa, tratando de diferenciar este tipo de la forma gástrica discreta más común. Se discute el criterio patológico de diferenciación y se ilustra el caso.

ZUSAMMENFASSUNG

Die Verfasser berichten einen seltenen Fall von diffuser Magenpolyposis und versuchen, diese Form von den haeufiger vorkommenden umschriebenen Magenpolypen zu differenzieren. Die pathologischen Kriterien der Unterscheidung werden eroertert. Die Arbeit ist mit Abbildungen ausgestattet.

RÉSUMÉ

On rapporte un cas rare de polypose vésicale. On a tenté de faire une différenciation anatomo-pathologique entre cette maladie et le polype solitaire de l'estomac. Illustrations à l'appui.

RIASSUNTO

E' riportato un raro caso di poliposi gastrica diffusa. Si cerca di differenziare questo tipo dal più comune di polipi gastrici discreti. Sono discussi i criteri di differenziazione anatomopatologica e sono presentate illustrazioni.

SUMÁRIO

Um raro caso de polipóse gastrica é relatado, em uma tentativa de diferenciar este tipo do polipo gastrico discréto e comum. Criterios de diferenciação patológica são discutidos e ilustrações são apresentadas.

BIBLIOGRAPHY

1. Balfour, D. C.: Polyposis of the Stomach, Surg., Gynec. & Obst. 28:465, 1919.
2. Brunn, H., and Pearl, F. L.: Diffuse Gastric Polyposis, Surg., Gynec. & Obst. 43:559-569, 1926.
3. Christopher, F.: Malignant Diffuse Polyposis, Ann. Surg. 106:139, 1937.
4. Eliason, E. L., and Wright, W. M.: Benign Tumors of the stomach, Surg., Gynec. & Obst. 41:461-472, 1925.
5. Habbe, J. E.: Diffuse Gastro-Duodenal Polyposis "en nappe", Am. J. Roentgenol. 28:68, 1932.
6. Heeks, W. G., and Gibb, W. T., Jr.: Gastric Polyposis, Report of a Case of "Polyadenoma en Nappe" Diagnosed Gastroscopically, Ann. Surg. 115:356, 1942.
7. Pearl, F. L., and Brunn, H.: Multiple Gastric Polyposis, Surg., Gynec. & Obst. 76:257-281, 1943.
8. Schindler, R.: Gastritis Simulating Tumor Formation, Am. J. Digest. Dis. 6:523-529, 1939.
9. Spriggs, E. I., and Marxer, O. A.: Polyps and Polypoid Gastritis, Quart. J. Med. 12:1-60, 1943.

Editorial

The Paris Orthopedic Clinics

DURING the recent visit to Paris of the American and English delegations in conjunction with the meeting of the Italian Chapter of the International College of Surgeons, May 3 and 4, several highly interesting operative clinics were held by outstanding French surgeons. Although these men were all general surgeons and not limited to orthopedics, the general quality of their orthopedic work was of the highest caliber, and all demonstrated unusual operative skill and dexterity. One was particularly impressed with the rapidity of their operative technic, which appeared to be attained by minimal ligation of small bleeders, keen knowledge of surgical anatomy, preconceived operative plans, elimination of repeated maneuvers, and rapid closure of the wound with the use of awl-like needle threaders instead of the conventional surgical needles and needle holders. Although wound closures were not as anatomic as they generally are in the United States, apparently there have been no unfavorable sequelae.

Dr. Judet demonstrated his acrylic head hip arthroplasty operation in a case of malum coxae senilis. The patient was a heavy white man aged 52 who had been suffering with hip pain for four and one-half years, with lesser involvement of the opposite hip and the sacroiliac joints. Dr. Judet removed an extremely large femoral head and replaced it with an acrylic prosthesis in twenty-five minutes. The two doctors Judet (brothers) have performed 500 acrylic femoral head operations, with excellent results in 85 per cent. The poor results, manifested by pain and limited motion of the hip, have occurred principally in cases of Marie-Strumpell arthritis and polyarthritis; the best results were obtained in cases of nonunion of fractures of the femoral neck, no failures having been observed in follow-up periods up to three years. Dr. Judet is now selecting certain fresh fractures of the femoral neck, especially subcapital fractures, for this type of operation.

Dr. Judet uses an anterior approach, a 6-inch (15 cm.) vertical incision centering over the anterior iliac spine, reflecting the sartorius and rectus femoris medially without stripping or sectioning. In his opinion there is less muscle damage with this type of reflection than with sectioning. He attributes some former postoperative difficulties to surgical muscle damage. (Other surgeons reflect these muscles laterally.) He carefully preserves the lateral femoral cutaneous nerve, as injury to this nerve has resulted in 5 cases of troublesome meralgia paresthetica. After cutting and tying the transverse circumflex femoral artery and vein he excises portions of the hip joint capsule (former attempts at preservation have been discarded), and removes the head with an osteotomy of the neck and a corkscrew device. Care is taken to preserve the femoral neck, especially in the presence of a mushroom-type deformity of the head. The acetabulum is not reamed unless reaming is mechanically required for greater depth. The femoral neck is trimmed with an osteotome and then reamed with a hand device, after which the corkscrew instrument is pushed through the neck to emerge from the cortex below the greater trochanter. After the neck has been smoothed with the reamer—this process also informs him of the size of prosthesis required—Dr. Judet inserts an acrylic head from above downward, so that the point barely penetrates the lateral femoral cortex.

Wound closure is performed with 3 or 4 wire sutures in the deep fascia and 3 or 4 silk sutures in the skin, plus skin

clips. A short inversion boot cast is applied for eight days to maintain the prosthesis within the acetabulum. Walking is generally commenced in twelve to fifteen days, after use of a rather simple suspension apparatus for passive motion in bed. A hip spica cast is used only after operation for subluxation. It is removed in fifteen days and walking begun in three weeks.

Dr. Judet also performed a bone graft for nonunion of a fracture of the femoral shaft, using fetal calf bone from his bone bank at Hospital St. Louis. He believes that a more sterile preparation is secured by killing the pregnant cow and has encountered no complications from this source of supply, which he uses extensively.

His final operation consisted of a wide sequestrectomy and débridement for osteomyelitis of the tibia, followed by partial osteotomy and collapse of the remnant of tibial cortex into the cavity so produced, allowing easier closure of the remaining skin but narrowing the leg. Tubes were inserted for later instillation of penicillin solution into the depths of the wound.

Professor Sicard at Hospital Beaujon had quite a varied schedule which he completed in two and one-half hours, using two operating rooms. A laminectomy for a herniated intervertebral lumbar disc was performed without benefit of myelogram, which he does not usually employ, exploring both the fourth and fifth lumbar and the lumbosacral interspaces. A partial laminectomy was done with ordinary bone rongeurs instead of the Kerrison type generally used in the United States. Only the extruded portion of the disc was removed, and the disc space itself was not curetted.

After performing an acrylic head arthroplasty of the hip for a recent subcapital fracture of the femoral neck (in seventeen minutes), he demonstrated a new acrylic prosthesis of his own design which he utilized in arthrodesing the lumbosacral portion of the spine for a missed fracture of the pars articularis (neural arch). The prosthesis is a rectangular device which fits over the spinous process of the fifth lumbar vertebra and is held in place by acrylic cross pins which penetrate holes drilled through the base of the spinous processes. Professor Sicard has not yet released this device, as it is still in the trial stage, but he has had excellent results without the postoperative use of a brace or a plaster cast. Patients are able to walk within a few days because of the firm immobilization secured with the prosthetic device.

The last operation consisted of an Albee type of bone graft 10 inches (25 cm.) long, from a bone bank fibula (postmortem source), placed in the dorsolumbar portion of the spine for Pott's disease of long standing. No attempt was made to arthrodese the zygo-apophysial joints or to prepare a bed of bone chips on the lamina, the graft merely being laid in place and the soft tissues closed over it. A previously prepared plaster jacket was used for postoperative immobilization.

Extreme cordiality and sincere efforts to demonstrate surgical technic were manifest in all of the clinics. The unanimous impression was that our French colleagues have made wonderful progress in the advancement of surgical technic in orthopedic surgery.

—Everett J. Gordon, M.D., F.A.C.S., F.I.C.S.

Genius believes its faintest presentiment against the testimony of all history, for it knows that facts are not ultimates, but that a state of mind is the ancestor of everything. *—Emerson*

Chapter News

International College of Surgeons

United States and Canadian Chapters

Arnold S. Jackson, M.D., F.A.C.S., F.I.C.S., Secretary

Chicago Assembly: As the time draws near for the Sixteenth Annual Assembly of the United States Chapter, International College of Surgeons, prospect looks bright for a record attendance and a memorable occasion. The program will be found on Page 249 of this issue. Pertinent information is repeated below for the convenience of members and guests:

The Palmer House, Chicago.

Committees: The following Committees are responsible for the various departments of Assembly procedure:

Arrangements

Chairman of the Assembly
RAYMOND W. MCNEALY, M.D., F.A.C.S., F.I.C.S., Chicago
Co-Chairmen
KARL A. MEYER, M.D., F.A.C.S., F.I.C.S., Chicago
MAX THOREK, M.D., LL.D., D.Sc., F.I.C.S., F.B.C.S., Chicago

Banquet

CHESTER W. TROWBRIDGE, M.D., F.A.C.S., F.I.C.S., Chicago

Convocation

Chairmen
HARRY A. OBERHELMAN, M.D., F.A.C.S., F.I.C.S., Chicago
CLEMENT L. MARTIN, M.D., F.A.C.S., F.I.C.S., Chicago

ERNEST F. PURCELL, M.D., F.I.C.S., Trenton, New Jersey
FRANCIS D. WOLFE, M.D., F.A.C.S., F.I.C.S., Chicago
CLAIRE E. CARR, M.D., F.A.C.S., F.I.C.S., Chicago
HORACE F. TURNER, M. D., F.A.C.S., F.I.C.S., Chicago
LOUIS F. PLZAK, M.D., F.A.C.S., F.I.C.S., Berwyn, Illinois
WALTER C. BURKET, M.D., F.I.C.S., Evanston, Illinois

Motion Picture Program

PHILIP THOREK, M.D., F.A.C.S., F.I.C.S., Chicago

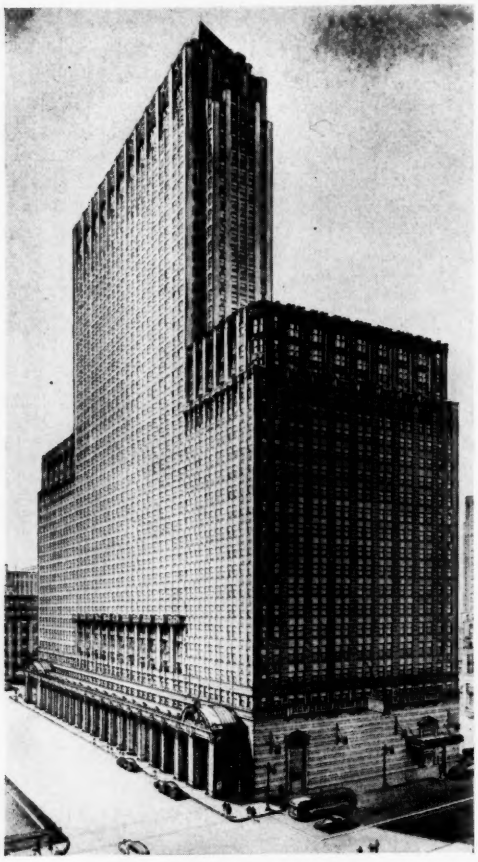
General Program

ARNOLD S. JACKSON, M.D., F.A.C.S., F.I.C.S., *Chairman*, Madison, Wisconsin

Motion Picture Program: Dr. Philip Thorek, in charge of the Motion Picture Program, announces that a program has been arranged which will appeal to surgeons and specialists alike.

Although technic is the point of greatest focus, emphasis is placed upon the newer type of film which presents the subject in its entirety.

The scope of the program includes the most recent surgical films pertaining to orthopedics, proctology, gynecology, the heart, the esoph-



Chicago Civic Opera House.

agointestinal tract, ophthalmology, the thorax, the nervous system, the biliary passages, the genitourinary system, the thyroid gland, the cardiovascular diseases, et cetera.

A Film Forum also is to be presented in which five surgical films will be shown, with the surgeon present to discuss his film.

The Motion Picture Program appears in this issue, Page 258.

Banquet: The Annual Banquet will be held in the Grand Ballroom of the Palmer House at 7:30 p.m. on the evening of Wednesday, September 12. The banquet speaker will be Mr. A. Lawrence Abel of London, whose topic will be "What Is Happening in Britain—Fact and Fiction." Mr. Abel is a Fellow of the Royal College of Surgeons of England and a member of its Council; Senior Surgeon at the Princess Beatrice Hospital and the Gordon Hospital for Rectal and Gastroenterological Diseases; Surgeon to the Royal Cancer Hospital; President of the Metropolitan Counties Branch of the British Medical Association and Council Member of that organization; Honorary Fellow of the American Medical Association, the American Proctologic Society and the International College of Surgeons.

Convocation: The Convocation ceremonies, with induction of new members of the United States Chapter of the College, will be held at the Civic Opera House on Thursday evening, September 13. The Honorable Estes Kefauver, United States Senator from Tennessee, will give the Convocation Address. His subject is "The America of Tomorrow."

Assembly Information: The following points are important:

Hotel Reservations: See inside front cover.

Registration, Sunday 2:00 p.m. through Thursday, 3:00 p.m., September 9-13, Palmer House, Chicago.

Advance registration (on Sunday) will save time.

Admission by badge only to all scientific Assemblies, section meetings, and to the exhibits. Present your I. C. of S. membership card to expedite registration. Registration fee, $5.00.

Bona fide doctors of medicine serving as residents and interns, if vouched for by written card or letter by the superintendent of their hospital or by an officer of the College, will be registered as guests. Please present credentials at Registration Desk.

One hundred thirty-seven scientific and technical exhibits will open daily at 8:30 a.m. and close at 5:30 p.m. Frequent intermissions to view the exhibits have been arranged before, during and after the assemblies.

Motion picture programs, incorporating modern surgical technics will be presented in the Scientific Exhibit Hall by Davis & Geck, Inc., Brooklyn, N. Y. The films will show continuously on Monday, Tuesday, Wednesday, Thursday, September 10-13, from 10:00 a.m. to 4:30 p.m.

For copy of Final Program, write the Secretary, Dr. Arnold S. Jackson, F.A.C.S., F.I.C.S., 1516 Lake Shore Drive, Chicago, Ill.

Program

Sixteenth Annual Assembly

United States Chapter

INTERNATIONAL COLLEGE OF SURGEONS

Grand Ballroom, Palmer House

Monday, September 10, 1951

MORNING SESSION

Presiding: W. Wayne Babcock, M.D., LL.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylania

Secretary: Kenneth Sawyer, M.D., F.A.C.S., F.I.C.S., Denver, Colorado

Symposium on Surgery of the Colon

A.M.

9:00- 9:20 **Glassman, Jacob A., M.D., F.A.C.S., F.I.C.S.,** Chicago, Illinois
Associate Clinical Professor, Surgery, Cook County Graduate School of Medicine; Associate Attending Surgeon, Cook County Hospital.
"Some Practical Anatomical Considerations in Colon Surgery"

9:20- 9:40 **Popper, Hans, M.D., Ph.D.**
Chicago, Illinois
Director, Department of Pathology, Cook County Hospital; Scientific Director, Hektoen Institute for Medical Research; Associate Professor, Pathology, Northwestern University Medical School.
"Newer Aspects of the Pathology of the Colon"

9:40-10:00 **Case, James T., M.D., D.M.R.E., F.A.C.S., F.I.C.S.,** Chicago, Illinois
Professor Emeritus of Radiology, Northwestern University Medical School; Radiologist, Highland Park Hospital; Consultant to U. S. Public Health Service and Passavant Memorial Hospital; Consultant in Surgery, Battle Creek Sanitarium.
"The Roentgenologic Findings in Carcinoma of the Colon"

10:00-10:40 **Intermission to View Exhibits**

10:40-11:00 **Portis, Sidney A., M.D., F.A.C.P.**
Chicago, Illinois
Associate Clinical Professor of Medicine, University of Illinois (Rush); Medical Chief of Psychosomatic Group, Michael Reese Hospital.
and
Lawrence, Charles H., M.D.
Chicago, Illinois
Clinical Assistant in Medicine, Northwestern University Medical School.
"The Early Diagnosis of Carcinoma of the Colon"

11:00-11:20 **McNealy, Raymond W., M.D., F.A.C.S., F.I.C.S.,** Chicago, Illinois
Professor of Surgery, Cook County Graduate School of Medicine; Associate Professor of Surgery, Northwestern University Medical School; Chief Surgeon, Wesley Memorial Hospital.
"Surgery of the Right Colon"

11:20-11:40 **Rosi, Peter A., M.D., F.A.C.S., F.I.C.S.,** Chicago, Illinois
Associate Professor of Surgery, Northwestern University Medical School; Attending Surgeon, Wesley and Cook County Hospitals.
"Surgical Treatment of Carcinoma of the Left Colon and Rectum"

11:40-12:00 **Wolfe, Francis D., M.D., F.A.C.S., F.I.C.S.,** Chicago, Illinois
Instructor in Surgery, Northwestern University Medical School; Attending Surgeon, Wesley Memorial Hospital.
"Diverticulitis of the Colon"

AFTERNOON SESSION

Presiding: W. R. Lovelace, M.D., F.I.C.S., D.I.B.S., Albuquerque, New Mexico

Secretary: H. H. Sharp, M.D., A.I.C.S., Downington, Pennsylvania

P.M.

2:00- 2:20 **Starry, Leo J., M.D., F.A.C.S., F.I.C.S.,** Oklahoma City, Oklahoma
Professor of Clinical Surgery and Director of Surgical Clinics, University of Oklahoma School of Medicine; Attending Surgeon, University Hospital and Oklahoma Hospital for Crippled Children; Chief of Staff, St. Anthony Hospital.
and
Dodson, Harrell, M.D.
Oklahoma City, Oklahoma
"Carcinoma of the Stomach"

2:20- 2:40 **Peterson, Frank R., M.D., F.A.C.S.**
Cedar Rapids, Iowa
Former Professor and Head of Department of Surgery, University of Iowa College of Medicine.
"Morbidity due to Incomplete Cholecystectomy"

2:40- 3:00 **Bacon, Harry E., M.D., F.A.C.S., F.A.P.S., F.I.C.S., F.R.S.M.**
Philadelphia, Pennsylvania
Professor and Head, Department of Proctology, Temple University Medical School; Head, Department of Proctology, St. Mary's Hospital.
and
McCrea, Lowrain E., M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylvania
and
Trimpi, Howard D., M.D.
Philadelphia Pennsylvania
"Pelvic Exenteration for Rectal Carcinoma with Cutaneous Ureterostomy"

3:00- 3:20 **Nordland, Martin, M.D., F.A.C.S.**
Minneapolis, Minnesota
Associate Clinical Professor, Surgery, University of Minnesota Medical School; Surgical Consultant, Glen Lake Sanatorium; Surgeon, Northwestern Hospital, Minneapolis.
"Retroperitoneal Tumors"

3:20- 3:40 **White, Charles S., M.D., Sc.D., F.A.C.S., F.I.C.S.**
Washington, D. C.
Chief Department of Surgery, Doctors Hospital.
and
Stubbs, Donald, M.D.
Washington, D. C.

"Intra-Arterial Transfusions in the Treatment of Massive Gastroduodenal Hemorrhage"

3:40- 4:10 **Intermission to View Exhibits**

4:10- 4:30 **McGregor, Douglas U., M.D., C.M., F.I.C.S.**, Hamilton, Canada.
Consulting Surgeon, St. Joseph's and Mountain Hospitals; Honorary Surgical Consultant, Hamilton General Hospital.
"Terminal Ileum Duplex"

4:30- 4:50 **Harper, Fred R., M.D., F.A.C.S.**
Denver, Colorado
Associate Professor of Surgery and Head of Department of Thoracic Surgery, University of Colorado School of Medicine.
"An Outline for the Treatment of Thoracic Injuries"

EVENING SESSION

P.M.
5:30 **Business meeting and dinner, Canadian Chapter of International College of Surgeons**
Film Forum: Scientific Motion Picture Program, with authors of film shown present for discussion.
Dr. Philip Thorek, Chicago, *Chairman*

Tuesday, September 11

MORNING SESSION

Presiding: Moses Behrend, M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylvania
Secretary: George Ferre, M.D., F.I.C.S. Miami Beach, Florida

A.M.
9:00-10:30 **PANEL DISCUSSION: "The Acute Surgical Abdomen"**
Jackson, Arnold S., M.D., F.A.C.S., F.I.C.S., Madison, Wisconsin, *Moderator*
Burns, Charles W., M.D., F.A.C.S., F.I.C.S., Winnipeg, Canada
Howser, John W., M.D., F.A.C.S., F.I.C.S., Chicago, Illinois
Hendricks, William A., M.D., F.I.C.S., Chicago, Illinois
Vaughn, Arkell M., M.D., F.A.C.S., F.I.C.S., Chicago, Illinois
Lichtenstein, Manuel E., M.D., F.A.C.S., F.I.C.S., Chicago, Illinois
Coffey, Ralph R., M.D., F.A.C.S., F.I.C.S., Kansas City, Missouri

10:30-11:00 **Intermission to View Exhibits**

Cardiovascular Symposium

11:00-11:20 **Fell, Egbert H., M.D., F.A.C.S.**
Chicago, Illinois
Clinical Associate Professor of Surgery, University of Illinois Medical School; Attending Surgeon, Presbyterian and Cook County Hospitals; Consultant in Cardio-Vascular Surgery, Mt. Sinai Hospital.
"Surgery for Congenital Anomalies of the Arch of the Aorta"

11:20-11:40 **Potts, Willis J., M.D., F.A.C.S.**
Chicago, Illinois
Associate Professor of Surgery, Northwestern University Medical School; Surgeon-in-Chief, Children's Memorial Hospital.
"Evaluation of the Surgical Treatment of Congenital Pulmonary Stenosis"

11:40-12:00 **Pearl, Felix L., M.D., F.A.C.S., F.I.C.S.**, San Francisco, California
Chief, Department of Sympathetic and Vascular Surgery, Mount Zion Hospital.
"Roentgenologic Visualization of the Coronary Arteries in the Intact Animal"

12:00-12:20 **Samuels, Saul S., M.D.**
New York, New York
Director and Attending Angiologist, The Brooklyn Hospital for the Aged; Chief Department of Peripheral Arterial Diseases, Stuyvesant Polyclinic Hospital; Associate Attending Angiologist, Manhattan General Hospital.
"Treatment of Gangrene of the Extremities"

AFTERNOON SESSION

Presiding: Curtice Rosser, M.D., F.A.C.S., F.I.C.S., Dallas, Texas
Secretary: Ralph E. Scovel, M.D., F.I.C.S., San Francisco, California

P.M.
2:00- 2:20 **Maxeiner, Stanley R., M.D., F.A.C.S., F.I.C.S.**, Minneapolis, Minnesota
Clinical Professor of Surgery, University of Minnesota Medical School; Senior Consultant in Surgery, U. S. Veterans Hospital, Minneapolis.
"Synovioma: Review of the Literature, Diagnosis, Pathology, Treatment, End Results"

2:20- 2:40 **Kurten, Russell M., M.D., F.A.C.S.**
Racine, Wisconsin
Chief of Surgery, St. Mary's Hospital; Consulting Surgeon, St. Luke's Hospital.
"Management of Intestinal Fistula"

2:40- 3:00 **Koontz, Amos R., M.D., D.Sc. (Hon.), F.A.C.S.**, Baltimore, Maryland
Assistant Professor of Surgery, Johns Hopkins University School of Medicine.
"Difficult Hernias: Use of Tantalum Mesh in Repair"

3:00- 3:20 **Adson, Alfred W., M.D., F.A.C.S., F.I.C.S. (Hon.)**, Rochester, Minnesota
Professor of Neurosurgery, Mayo Foundation; Senior Neurosurgeon, Mayo Clinic.
"Cervical Ribs: Symptoms, Differential Diagnosis and Indications for of the Insertion of the Scalenus Anticus Muscle"

3:20- 4:00 **Intermission to View Exhibits**

4:00- 4:20 **Marshall, Samuel F., M.D., F.A.C.S.**
Boston, Massachusetts
Surgeon, Lahey Clinic, New England Deaconess Hospital and New England Baptist Hospital.
"Follow-up Results of Surgery in Gastric Cancer; A Plea for Earlier Diagnosis and More Radical Surgery"

4:20- 4:40 **Dotter, Charles T., M.D.**
New York, New York
Assistant Professor of Radiology, Cornell University Medical College; Instructor in Medicine, Cornell University Medical College.
and
Steinberg, Israel, M.D.
New York, New York
"Angiocardiography in the Differential Diagnosis and Prognostic Evaluation of Mediastinal Tumors"

EVENING SESSION

Grand Ballroom

Presiding: M. Leopold Brodny, M.D., F.A.C.S., F.I.C.S., Boston, Massachusetts
Secretary: Cyril K. Church, M.D., F.I.C.S., New York, New York

Urology

P.M.

8:00- 8:20 **Thompson, Gershom J., M.D., F.A.C.S., F.I.C.S. (Hon.)**
Rochester, Minnesota
"Recent Advances in Prostatic Surgery of Interest to the General Surgeon"

8:10- 8:20 **Rolnick, Harry C., M.D., F.A.C.S., F.I.C.S.,** Chicago, Illinois
"Urological Literature and the General Surgeon"

8:20- 8:30 **Smith, Parke G., M.D., F.A.C.S.**
Cincinnati, Ohio
"Recent Urological Armamentarium of Interest to the General Surgeon, Especially Renal Arteriography"

8:30- 8:40 **Burns, Edgar, M.D., F.A.C.S.**
New Orleans, Louisiana
"Progress in Pediatric Urology of Interest to the General Surgeon"

8:40- 8:50 **Carroll, Grayson, M.D., F.A.C.S.**
St. Louis, Missouri
"Antibiotics"

8:50- 9:10 **Discussion**

Obstetrics and Gynecology

Presiding: Gilbert F. Douglas, M.D., F.A.C.S., F.I.C.S., Birmingham, Alabama

9:00- 9:10 **Kelso Joseph W., M.D., F.A.C.S., F.I.C.S.,** Oklahoma City, Oklahoma
"What's New in Pelvic Surgery"

9:10- 9:20 **Mishell, Daniel R., M.D., F.I.C.S.**
Beverly Hills, California
"Recent Developments in the Study of Sterility"

9:20- 9:30 **Soule, Samuel D., M.D., F.A.C.S.**
St. Louis, Missouri
"Control and Elimination of the Acute Post-Surgical Menopause with Use of Estradiol Pellet Performed at the Time of Surgery"

9:30- 9:40 **Greenblatt, Robert B.**
Augusta, Georgia
"Clinical Application of Vulvar Fluorescence"

Wednesday, September 12

MORNING SESSION

Presiding: George M. Curtis, M.D., F.A.C.S., F.I.C.S. (Hon.), Columbus, Ohio
Secretary: Lloyd Netto, M.D., F.I.C.S.
West Palm Beach, Florida

Symposium: "Acute Intestinal Obstruction"

A.M.

9:00- 9:20 **Gatch, Willis D., M.D., F.A.C.S.**
Indianapolis, Indiana
Professor of Surgery and Head of Department of Surgery, Indiana University School of Medicine.
"The Causes of Death from Bowel Obstruction, with Deductions on Treatment"

9:20- 9:40 **Lockwood, Ira H., M.D., F.I.C.S. (Radiology),** Kansas City, Missouri
Director, Department of Radiology, Research Hospital and Clinic; Consulting Radiologist, Kansas City Municipal Hospital.
"Acute Small Intestinal Obstructions"

9:40-10:00 **Hunt, Claude J., M.D., F.A.C.S., F.I.C.S.,** Kansas City, Missouri
Chief, Hunt Surgical Clinic; Chief Surgeon, Research Hospital and Kansas City General Hospital.
"Acute Intestinal Obstruction in the Small Bowel"

10:00-10:20 **Harris, Franklin I., M.D., F.A.C.S., F.I.C.S.,** San Francisco, California
Chief of Staff and Chief of Department of Surgery, Mount Zion Hospital.
"Indications and Contra-Indications for Intestinal Intubation in Acute Intestinal Obstruction"

10:20-11:00 **Intermission to View Exhibits**

11:00-12:00 **Panel Discussion: "Acute Intestinal Obstruction"**
Acuff, Herbert, M.D., F.A.C.S., F.I.C.S., Knoxville, Tennessee, *Moderator*
Thorek, Philip, M.D., F.A.C.S., F.I.C.S., Chicago, Illinois
Pontius, Guy V., M.D., F.A.C.S., Chicago, Illinois
Noble, Thomas B., Jr., M.D., F.I.C.S., Indianapolis, Indiana

AFTERNOON SESSION

Presiding: R. J. Wilkinson, M.D., F.A.C.S., F.I.C.S., Huntington, West Virginia
Secretary: Andrew W. Bunten, M.D., F.I.C.S., Cheyenne, Wyoming

P.M.

2:00- 2:20 **Appleby, Lyon H., M.D., F.R.C.S. (Eng.), F.R.C.S. (Can.), F.A.C.S., F.I.C.S.,** Vancouver, Canada
Chief Surgeon, St. Paul's Hospital; Consulting Surgeon, Children's Hospital.
"Gas Cysts of the Intestine"

2:20- 2:40 **Thompson, William J., M.D., F.A.C.S., F.I.C.S.,** St. Louis, Missouri
Chief, Surgical Division, De Paul Hospital; Surgical Consultant, St. Louis City Hospital.
"Acute Sigmoid Diverticulitis"

2:40- 3:00 **Bisgard, J. Dewey, M.D., F.A.C.S.**
Omaha, Nebraska
Professor of Surgery, University of Nebraska School of Medicine; Chief of Surgery, Bishop Clarkson Memorial Hospital; Attending Surgeon, Nebraska Methodist and Children's Memorial Hospitals.
"Some Benign Surgical Lesions of the Esophagus"

3:00- 3:20 **Coleman, Everett P., M.D., F.A.C.S., F.I.C.S.,** Canton, Illinois
Chief of Staff, Graham Hospital; Chief Surgeon, Coleman Clinic.
"Late Complications Following Gallbladder Surgery"

3:20- 4:10 **Intermission to View Exhibits**

4:10- 4:30 **Klemme, Roland M., M.D., F.A.C.S., F.I.C.S.,** St. Louis, Missouri
Professor of Surgery, St. Louis University School of Medicine.
"Pain—Chemotherapeutic and Surgical Approach"

4:30- 4:50 **Bartlett, Willard, Jr., M.D., F.A.C.S., F.I.C.S.,** St. Louis, Missouri
Assistant Professor of Clinical Surgery, St. Louis University School of Medicine.
"Obesity in Relation to Ventral Hernia Repair"

Wednesday Evening, September 12

Banquet

Grand Ballroom, Palmer House, Chicago
7:30 P.M.
(Dress Optional)

A. Lawrence Abel, M.S., London; F.R.C.S. (Eng.), F.I.C.S. (Hon.), London, England

Member of Council, Royal College of Surgeons of England; Senior Surgeon, The Princess Beatrice Hospital; Senior Surgeon, The Gordon Hospital for Rectal and Gastro-Enterological Diseases; Surgeon, The Royal Cancer Hospital; President, Metropolitan Counties Branch, British Medical Association; Member of Council, British Medical Association; Hon. Fellow of the American Medical Association; Hon. Fellow of the American Proctologic Society.
"What Is Happening in Britain—Fact and Fiction"

Thursday, September 13

MORNING SESSION

Presiding: Paul F. Doege, M.D., F.A.C.S., F.I.C.S., Marshfield, Wisconsin
Secretary: J. M. de los Reyes, M.D., F.A.C.S., F.I.C.S., Los Angeles, California

A.M.

9:00- 9:20 **McRoberts, J. W., M.D., M.C., M.Sc. (Surg.), F.A.C.S., F.I.C.S.**
Sheboygan, Wisconsin
Preceptor, University of Wisconsin Medical School; Surgeon, Sheboygan Memorial Hospital.
"Experiences with Acute Pain in the Left Lower Quadrant"

9:20- 9:30 **Lans, Hyman S., M.D.**
Chicago, Illinois
Resident Surgeon, Cook County Hospital; Research Fellow, Hektoen Institute for Medical Research of the Cook County Hospital; Founder Junior Member, International College of Surgeons.
and
Stein, Irving F., Jr., M.D., F.A.C.S., F.I.C.S., Chicago, Illinois
Associate Professor of Obstetrics and Gynecology, Northwestern University Medical School.
and
Meyer, Karl A., M.D., F.A.C.S., F.I.C.S., Chicago, Illinois
Professor of Surgery, Northwestern University Medical School; Chairman, Department of Surgery, Cook County Hospital.
"The Occurrence and Treatment of Potassium Deficiency in Surgical Patients"

9:30- 9:40 **Hobbins, William B., M.D.**
Chicago, Illinois
Senior Surgical Resident, Cook County Hospital.
and
Aries, Leon J., M.D., F.A.C.S.
Chicago, Illinois
Assistant Professor of Surgery, Northwestern University Medical School; Professor of Surgery, Cook County Graduate School.
"Incarcerated Diaphragmatic Hernia"

9:40-10:00 **Holmgren, Luther E., M.D., F.A.C.S.**
Madison, Wisconsin
Surgeon, Jackson Clinic.
"Modern Concepts of Treatment of Varicose Veins"

10:00-10:40 **Abel A. Lawrence, M.S., F.R.C.S.**
London, England
Senior Surgeon, The Princess Beatrice Hospital; Senior Surgeon, The Gordon Hospital for Rectal and Gastro-Enterological Diseases; Surgeon, The Royal Cancer Hospital.
"Abdomino-Perineal Operation for Carcinoma of the Rectum"

10:40-11:00 **Intermission to View Exhibits**

11:00-11:20 **Good, Louis P., M.D., M.S., F.A.C.S.**
Texarkana, Texas
Chief of Staff, Southern Clinic; President of Staff, St. Michael's Hospital.
"A Quick Method for Mobilization of the Intra-Pancreatic Portion of the Common Duct and its Use in Repairing Extensive Defects in the Biliary System"

11:20-12:00 **Allen, Harvey S., M.D., F.A.C.S.**
Chicago, Illinois
Assistant Professor of Surgery, Northwestern University Medical School; Attending Surgeon, Passavant Memorial and Cook County Hospitals.
"Management of Burns"

AFTERNOON SESSION

Presiding: Karl A. Meyer, M.D., F.A.C.S., F.I.C.S., Chicago, Illinois
Secretary: J. O. Morgan, M.D., F.A.C.S., F.I.C.S., Gadsden, Alabama

P.M.

2:00- 2:20 **Meyeding, Henry W., M.D., M.S. F.A.C.S., F.I.C.S.**, Rochester, Minnesota
Professor of Orthopedic Surgery, Mayo Foundation, University of Minnesota Medical School; Senior Consulting Orthopedic Surgeon, Mayo Clinic.
"Some Recent Advances in Surgery of the Bones and Joints"

2:20- 2:30 **Hall, Custis Lee, M.D., F.A.C.S., F.I.C.S.**, Washington, D. C.
Clinical Professor of Surgery, George Washington Medical School; Chief, Department of Orthopedics, Doctors Hospital; Consultant in Orthopedic Surgery, Naval Medical Center.
"Discussion of Paper Presented by Dr. Henry W. Meyerding"

2:30- 2:40 **Garceau, George J., M.D., F.I.C.S.**
Indianapolis, Indiana
Professor of Orthopedic Surgery, Indiana University Medical School.
"Discussion of Paper Presented by Dr. Henry W. Meyerding"

2:40- 3:10 **Intermission to View Exhibits**

3:10- 3:30 **Kline, Philip S., M.D.**
San Antonio, Texas
Former Instructor of Neoplastic Diseases, Hines Hospital, Hines, Illinois; Former Chief, Surgical Service, McCloskey Veterans Administration Center, Temple, Texas.
"The Gastric Cripple Following Total Gastrectomy and a Suggested Solution"

3:30- 3:50 **Yanagi, Soichi, M.D., F.I.C.S.**
Sapporo, Japan
Professor of Surgery, Hokkaido University College of Medicine.
"Thermal Effects on Wound Healing"

3:50- 4:10 **Mayo, Charles W., M.D., M.S., LL.D., F.A.C.S.**, Rochester, Minnesota
Professor of Surgery, Mayo Foundation, University of Minnesota Medical School; Surgeon, Mayo Clinic.
"Unsuspected Cholelithiasis Discovered at Laparotomy"

4:10- 4:30 **Bendani, Prof. Dr. Giuseppe, M.D., F.I.C.S.**, Rome, Italy
Professor of Clinical Surgery, University of Rome.
(Title to be announced later)

Thursday, September 13

Convocation

Chicago Civic Opera House, Chicago

7:30 **Induction of new members**

Section Meetings

Orthopedic Section

Monday, September 10

MORNING SESSION

Palmer House, Crystal Room

Presiding: Edward L. Compere, M.D., F.A.C.S., F.I.C.S., Chicago, Illinois

Secretary: Carlo Scuderi, M.D., F.A.C.S., F.I.C.S., Chicago, Illinois

A.M.

9:30-10:00 **Anderson, Roger, M.D., F.A.C.S., F.I.C.S.,** Seattle, Washington
Senior Consultant, University of Washington School of Medicine; Chief, Orthopedic Staff, King County Hospital; Orthopedic Consultant, U. S. Marine Hospital, Seattle.
"Acrylic Replacements for Head and Neck of the Femur"

10:00-10:30 **Chandler, Fremont A., M.D., F.A.C.S., F.I.C.S.,** Chicago, Illinois
Professor of Orthopedic Surgery, University of Illinois School of Medicine; Senior Attending Orthopedic Surgeon, St. Luke's Hospital, Chicago.
"Muscular Torticollis"

10:30-11:00 **McMaster, Paul E., M.D., F.A.C.S., F.I.C.S.,** Los Angeles, California
Clinical Professor of Orthopedic Surgery, University of Southern California School of Medicine; Senior Orthopedic Consultant, Sawtell (U. S. Veterans') Hospital.
"The Use of Suction Socket Prosthesis for Above-Knee Amputation"

11:00-11:30 **Pipkin, Garrett, M.D., F.A.A.O.S., F.I.C.S.,** Kansas City, Missouri
Attending Orthopedic Surgeon, Kansas City General Hospital and St. Joseph Hospital.
"Intramedullary 'K' Nail Fixation of the Humerus to the Spine of the Scapula for Shoulder Arthrodesis"

11:30-12:00 **Young, H. Herman, M.D., M.S., F.A.C.S.,** Rochester, Minnesota
Assistant Professor of Orthopedic Surgery, The Mayo Foundation; Consulting Orthopedic Surgeon, Mayo Clinic, Colonial and St. Mary's Hospitals.
"Non-Neurologic Lesions Simulating Protruded Intervertebral Disk"

AFTERNOON SESSION

P.M.

2:00- 2:30 **Jewett, Eugene L., M.D., F.A.C.S., F.I.C.S.,** Orlando, Florida
Attending Orthopedic Surgeon, Orange Memorial Hospital, Orlando; Consulting Orthopedic Surgeon, Florida Sanitarium and Hospital, Orlando.

And Co-authors:
Albee, Fred H., Jr., M.D., F.I.C.S.
Powers, Earl J., M.D., F.I.C.S.
Stanford, Freeman DeWitt, M.D.
"Treatment of all Fractures of the Femoral Neck and Trochanteric Region with the Original One-Piece Flange Nail"

2:30- 3:00 **Hall, Custis Lee, M.D., F.A.C.S., F.I.C.S.,** Washington, D. C.
Clinical Professor of Surgery, George Washington Medical School; Chief, Department of Orthopedics, Doctors Hospital; Consultant in Orthopedic Surgery, Naval Medical Center.
"Pelvic Anchor Supersedes Counter-Traction"

3:00- 3:30 **Scuderi, Carlo S., M.D., F.A.C.S., F.I.C.S.,** Chicago, Illinois
Associate Professor of Surgery, University of Illinois School of Medicine; Professor of Surgery, Cook County Graduate School.

and
Ippolito, Anthony, M.D.
"Prevention and Treatment of Non-Union of Supra-Condylar Fractures of the Femur"

3:30- 4:00 **Moe, John H., M.D., F.A.C.S.** Minneapolis, Minnesota
Assistant Clinical Professor of Orthopedic Surgery, University Hospital; Chief, Orthopedic Staff, Minneapolis General Hospital.
"Treatment of Intertrochanteric Fractures. Experiences with Various Methods of Internal Fixation"

4:00- 4:30 **Miller, Donald S., M.D., Ph.D., F.A.C.S., F.I.C.S.,** Chicago, Illinois
Professor of Orthopedic Surgery, Cook County Graduate School of Medicine; Chairman, Orthopedic Surgery, Chicago Medical School; Attending Surgeon, Cook County Hospital.
"Gangrene of the Extremities, Precipitated by Orthopedic and Traumatic Conditions (in Patients with Normal and Reduced Circulation)"

4:30- 5:00 **Padula, Ralph H., M.D., F.I.C.S.** South Norwalk, Connecticut
Attending Orthopedic Surgeon, Norwalk General Hospital; Director of Orthopedics, St. Joseph's Hospital, Stamford.
"Ruptured Intervertebral Discs, A Five-Year Follow-up of 114 Operated Cases"

Plastic Surgery Section

Tuesday, September 11

Palmer House, Crystal Room

MORNING SESSION

Presiding: Neal Owens, M.D., F.A.C.S., New Orleans, Louisiana

Secretary:

A.M.

9:00- 9:30 **Owens, Neal, M.D., F.A.C.S., F.I.C.S.** New Orleans, Louisiana
Professor of Plastic Surgery, Tulane University of Louisiana School of Medicine; Head of Department, Plastic Surgery, Eye, Ear, Nose and Throat Hospital; Senior Visiting Surgeon in Charge of Plastic Surgery (Tulane Unit), Charity Hospital.
"Chairman's Address"

9:30-10:00 **Sutton, Leon E., M.D., F.A.C.S.** Syracuse, New York
Professor of Clinical Plastic Surgery, Syracuse University College of Medicine; Chief of Plastic Surgery, University and Memorial Hospitals.
"The Treatment of Scar Contractures of the Extremities in Children"

10:00-10:30 **Figi, Frederick A., M.D., F.A.C.S.** Rochester, Minnesota
Professor of Plastic Surgery, Minnesota Graduate School, Mayo Foundation; Head of Section, Plastic Surgery and Laryngology, Mayo Clinic.
"Repair of Postoperative Harelip and Nasal Deformities"

10:30-11:00 **Steffensen, Wallace H., M.D., F.A.C.S., F.I.C.S.,** Grand Rapids, Michigan
Consultant in Plastic Surgery, Blodgett Memorial Hospital, Grand Rapids.
"Further Considerations in the Repair of the Unilateral Cleft Lip"

11:00-11:30 **O'Connor, Gerald Brown, M.D., F.A.C.S.,** San Francisco, California

Clinical Instructor in Surgery, Stanford University School of Medicine.
"The Treacher-Collins Syndrome"

11:30-12:00 **Pickrell, Kenneth, M.D., F.A.C.S.** Durham, North Carolina
Professor of Plastic and Maxillo-Facial Surgery, Duke University School of Medicine and Duke Hospital, Durham.
"Tumors of the Face and Neck in Children"

12:00-12:30 **Davis, Albert D., D.D.S., M.D., F.A.C.S.,** San Francisco, California
Assistant Clinical Professor of Surgery (Plastic), Stanford University School of Medicine.
"The Problem of Melanoma"

AFTERNOON SESSION

P.M.

2:00- 2:30 **Dingman, Reed O., D.D.S., M.D., M.S., F.A.C.S.,** Ann Arbor, Michigan
Associate Professor of Oral Surgery and Special Lecturer in Oral and Maxillofacial Surgery, University of Michigan Medical School.
"The Use of Iliac Bone in the Repair of Cranial Defects"

2:30- 3:00 **Adams, William M., M.D., F.A.C.S., F.I.C.S.,** Memphis, Tennessee
Assistant Professor of Surgery (Plastic), University of Tennessee College of Medicine; Attending Plastic Surgeon, Baptist Memorial, St. Joseph, Methodist and John Gaston Hospitals, Memphis.
"The Relation of the Plastic Surgeon in the Rehabilitation of the Crippled Child"

3:00- 3:30 **Pierce, George Warren, M.D., F.A.C.S.,** San Francisco, California
Chief, Department of Plastic Surgery, St. Francis Hospital; Consulting Plastic Surgeon, Children's, U. S. Marine, Mount Zion, Southern Pacific, and French Hospitals.
"Early Orthodonture in the Cleft Palate Patient"

3:30- 4:00 **Slaughter, Wayne B., M.D.** Chicago, Illinois
"The Service Problem in Complete Rehabilitation of the Child with Cleft Palate"

4:00- 4:30 **Kemper, John W., D.D.S., M.D., F.A.C.S.,** Ann Arbor, Michigan
Professor of Oral Surgery, Dentistry, University of Michigan Medical School; Head of Oral Surgery, University Hospital.
"Retropositioning the Soft Palate by Osteomucoperiosteal Flaps"

4:30- 5:00 **Kitlowski, Edward A., M.D.** Baltimore, Maryland
Clinical Professor of Plastic Surgery, University of Maryland School of Medicine.
"Reconstruction of Post-traumatic Palates"

5:00- 5:30 **Bethea, John Hardee, M.D.** Detroit, Michigan
Senior Instructor in Plastic Surgery, Wayne University College of Medicine; Diplomate of American Board of Plastic Surgery.
"Surgical Correction of Congenital Deformities of the Hands"

Section on Ophthalmology and Otorhinolaryngology

Tuesday, September 11

Clinical Meetings

MORNING SESSION—OPHTHALMOLOGY

Chicago Eye, Ear, Nose and Throat Hospital
231 West Washington Street

A.M.

9:00- 9:30 **Surgery, Dry Clinics. Round-Table Discussions.**
Nugent, Oscar B., M.D., F.A.C.S., F.I.C.S.
Professor of Ophthalmology, Chicago Eye, Ear, Nose and Throat College and Staff.
"Surgery of Dislocated Lenses in Children" (Author's Technique) Slides, Dry Clinics and Presentation of Cases.
Wolfe, Otis R., M.D., F.I.C.S. Marshalltown, Iowa
Chief, Department of Ophthalmology, Deaconess Hospital.
"Marfan's Syndrome"
Perritt, Richard A., M.D., F.I.C.S. Chicago, Illinois
Associate, Department of Ophthalmology, Northwestern University.

MORNING SESSION—OTORHINOLARYNGOLOGY

Clinic-Research and Educational Hospital
1835 West Polk Street

10:00-12:00 **"What's New in Broncho-Esophagology"**
Holinger, H. Paul, M.D., F.A.C.S. Chicago, Illinois
Professor, Broncho-Esophagology, Department of Otolaryngology, University of Illinois.

Wednesday, September 12

Palmer House, Crystal Room

MORNING SESSION—OTORHINOLARYNGOLOGY

Presiding: Matthew S. Ersner, M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylania
Secretary: Louis Savitt, M.D., F.I.C.S., Chicago, Illinois

A.M.

10:00-10:20 **Goldman, Irving B., M.D., F.A.C.S., F.I.C.S.,** New York, New York
Attending Rhinoplastic Surgeon, Mount Sinai Hospital; Attending Otolaryngologist and Rhinoplastic Surgeon, Beekman-Downtown Hospital.
"Maxillo-Facial Triad and Its Correction"

10:30-10:50 **McNaught, Robert Chamberlain, M.D.** San Francisco, California

11:00-11:20 **Lederer, Francis L., M.D., F.A.C.S.** Chicago, Illinois
Professor and Head, Department of Otolaryngology Clinic-Research and Educational Hospital, University of Illinois; Otolaryngologist-in-Chief, Illinois Eye and Ear Infirmary.
"The Menacing Spectre of Chronic Aural Suppuration"

11:30-11:50 **Tucker, Gabriel, M.D., F.A.C.S.** Philadelphia, Pennsylvania
Professor of Broncho-Esophagology and Laryngeal Surgery, Graduate School of Medicine, University of Pennsylvania.
"Tumors of the Larynx"

12:00 Noon **Luncheon Meeting of the Executive Committee**

AFTERNOON SESSION—OPHTHALMOLOGY

Palmer House, Crystal Room

Presiding: Edmund B. Spaeth, M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylvania
Secretary: Clarence H. Albaugh, M.D., F.A.C.S., F.I.C.S., Los Angeles, California

P.M.

2:20- 2:40 **Gailey, Watson, M.D., F.I.C.S.** Bloomington, Illinois
Chief Surgeon, Gailey Eye Clinic.
"Do's and Don'ts of Cataract Surgery"

Ophthalmology and Otorhinolaryngology Section

Wednesday, September 12

2:50- 3:10 **Berens, Conrad, M.D., F.A.C.S., F.I.C.S.**, New York, New York
pital, University of Illinois; Otolaryngologist-of Research, New York Eye and Ear Infirmary.

and

Girard, Louis J., M.D.
New York, New York
"Secondary Glaucoma" (Surgical Management and with Especial Reference to Cycloelectrolysis)

3:20- 3:40 **Mayer, Leo J., M.D., F.I.C.S.**
St. Louis, Missouri
Ophthalmologist, Jewish Hospital.
"Fundamentals of Eye Surgery"

3:50- 4:10 **Krewson, William E., III, M.D., F.A.C.S.**, Philadelphia, Pennsylvania
Assistant Professor of Ophthalmology, Graduate School, University of Pennsylvania.
"Effect of Inferior Oblique Surgery upon Lateral Deviation"

Thursday, September 13

MORNING SESSION—OPHTHALMOLOGY

Palmer House, Crystal Room

Presiding: Edmund B. Spaeth, M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylvania

Secretary: Richard A. Perritt, M.D., F.I.C.S., Chicago, Illinois

A.M.

10:00-10:20 **(Paper by West Coast Speaker—Retinal Separation.)**

10:30-10:50 **(Paper by Foreign Guest Speaker)**

11:00-12:00 **Study Club: "Interesting Maneuvers in Cataract Surgery"**
Moderator: Paul C. Craig, M.D., F.A.C.S., F.I.C.S., Reading, Pennsylvania
Instructors: Watson Gailey, M.D., F.I.C.S., Bloomington, Illinois
Samuel G. Higgins, M.D., F.I.C.S., Milwaukee, Wisconsin

Ophthalmology and Otorhinolaryngology Section

Thursday Evening, September 13

MORNING SESSION—OTORHINOLARYNGOLOGY

Albert Merritt Billings Hospital
950 East 59th Street

10:00-12:00 **Surgical Clinics**
"The Surgical Management of Carcinoma of the Paranasal Sinuses"
Lindsay, John, M.D., F.A.C.S.
Chicago, Illinois
Chief of Staff, Chicago University Clinic; Professor of Otolaryngology, Chicago University.

and

Schuknecht, Harold F., M.D.
Chicago, Illinois

12:30 **Luncheon—Palmer House**

Presiding: Edmund B. Spaeth, M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylvania

Secretary: Paul C. Craig, M.D., F.A.C.S., F.I.C.S., Reading, Pennsylvania
Luncheon of entire Section in honor of foreign guests. Non-scientific addresses by guests of honor for Ophthalmology and Oto-Rhino-Laryngology.

2:30- 2:45 **Business Meeting of Entire Section**
Palmer House, Crystal Room

Presiding: Edmund B. Spaeth, M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylvania

Secretary: Paul C. Craig, M.D., F.A.C.S., F.I.C.S., Reading, Pennsylvania

AFTERNOON SESSION—OTORHINOLARYNGOLOGY

Presiding: Chevalier L. Jackson, M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylvania

Secretary: Louis Savitt, M.D., F.A.C.S., F.I.C.S., Chicago, Illinois

Thursday, September 13

2:45- 3:15 **Study club: On Treatment of Sinus Diseases**
Moderator: Matthew S. Ersner, M.D., F.A.C.S., F.I.C.S., Philadelphia, Pennsylvania
Instructors: To be announced later.

3:30- 4:00 **(Paper by Foreign Guest Speaker)**

Friday, September 14

Ophthalmology—Clinical Meetings
Northwestern University Medical School
Ward Memorial Building
303 East Chicago Avenue
Dry Clinics. Discussions of Various Phases of Ophthalmology.
Vail, Derrick T., M.D., F.A.C.S.
Chicago, Illinois
Professor and Chairman, Department of Ophthalmology, Northwestern University Medical School and Staff.

Urology Section

Wednesday Morning, September 12

Palmer House, Room 18

Presiding: M. Leopold Brodny, M.D., F.A.C.S., F.I.C.S., Boston, Massachusetts

Secretary: Cyril Klock Church, M.D., F.I.C.S., New York, New York

A.M.

9:00- 9:20 **Flocks, Rubin H., M.D., F.A.C.S.**
Iowa City, Iowa
Professor and Head, Department of Urology, State University of Iowa College of Medicine; Chief Urologist, University Hospitals.
"Carcinoma of the Prostate"

9:20- 9:40 **McCrea, Lowrain E., M.D., F.A.C.S., F.I.C.S.**, Philadelphia, Pennsylvania
Clinical Professor of Urology, Temple University School of Medicine; Attending Urologist, Philadelphia General Hospital.
"The Importance of Nerve Supply of the Urinary Bladder in Surgery of the Recto-Sigmoid"

9:40-10:00 **de la Peña, Alfonso, Prof. Dr., F.I.C.S.**, Madrid, Spain
Professor of Urology, Faculty of Medicine, University of Madrid.
"Phlebographic Studies of the Pelvic Plexus on the Living Subject"

10:00-10:40 **Intermission to View Exhibits**

10:40-11:00 **Tracy, Edward M., M.D.**
Buffalo, New York
"Steroid Hormones in Carcinoma of the Prostate"

11:00-11:20 **Nicely, Eugene Park, M.D., F.I.C.S.**
Knoxville, Tennessee
Chief of Urology, St. Mary's Memorial Hospital.
"Urological Symptoms Relieved by

Postural Correction"

11:20-11:40 **Thompson, Gershom J., M.D., F.A.C.S., F.I.C.S. (Hon.)**, Rochester, Minnesota
"The Treatment of Vesical Neoplasm"

11:40 **Discussion—Moderator:**
George H. Ewell, M.D., F.I.C.S.
Madison, Wisconsin

Obstetrics and Gynecology Section

Wednesday Morning, September 12

Palmer House, Room 14

A.M.

9:00- 9:15 **Cohen, M. Stanley, M.D., F.A.C.S., F.I.C.S.**, Philadelphia, Pennsylvania
Associate, Department of Obstetrics and Gynecology, Temple University Medical School; Assistant Obstetrician and Gynecologist, Jewish Hospital; Associate Obstetrician and Gynecologist, Temple University Hospital.
"The Practical Application of Analgesia and Anesthesia in Obstetrics"

9:15- 9:30 **Galloway, Charles E., M.D., F.A.C.S.**
Evanston, Illinois
Former Assistant Professor of Obstetrics and Gynecology, Northwestern University Medical School; Obstetrician and Gynecologist, Evanston Hospital.
"The Cervix in Pregnancy"

9:30 9:45 **Daniel, Walter W., M.D., F.I.C.S.**
Atlanta, Georgia
Former Instructor, Emory University School of Medicine.
and
Inman, John, M.D.
"Rupture of the Pregnant Uterus"

9:45-10:00 **Hahn, George A., M.D., F.A.C.S.**
Philadelphia, Pennsylvania
Associate in Obstetrics and Gynecology, Jefferson Medical College.
"Uterine Malignancy—Method of Treatment"

10:00-10:45 **Intermission to View Exhibits**

10:45-11:00 **Rucker, M. Pierce, M.D., LL.D.**
Richmond, Virginia
Emeritus Obstetrician-in-Chief, Johnston-Willis Hospital.
"Obstetric Difficulties"

11:00-11:15 **Andrews, Gould, M.D.**
Oak Ridge, Tennessee
Assistant Professor of Medicine, Medical College of Alabama; Chief of Clinical Service, Oak Ridge Institute of Nuclear Studies.
"Therapeutic Uses of Radioisotopes"

11:15-11:30 **Douglas, Gilbert F., M.D., F.A.C.S., F.I.C.S.**, Birmingham, Alabama
Associate Professor of Gynecology, Medical College of Alabama.
(Chairman's Address) "Uterine Bleeding—Vision of Joy or a Sign of Woe"

11:30-11:45 **Ayre, James E., M.D.**
Montreal, Canada
"Cancer Detection"

Occupational Surgery Section

Thursday Afternoon, September 13

Palmer House, Room 14

P.M.

2:00- 2:30 **Aitken, Alexander P., M.D., F.A.C.S.**
Boston, Massachusetts
Instructor in Orthopedic Surgery, Tufts College Medical School.
"End Results of Ruptured Intervertebral Discs in Industry"

2:30- 3:00 **Kelikian, Hampar, M.D., F.A.C.S., F.I.C.S.**, Chicago, Illinois
Assistant Professor of Bone and Joint Surgery, Northwestern University Medical School; Senior Orthopedic Surgeon, Wesley Memorial Hospital; Attending Orthopedic Surgeon, Cook County Hospital.
"Arthritic Occupational Disabilities and their Treatment by Surgery"

3:00- 3:30 **Intermission to View Exhibits**

3:30- 4:00 **Lewis, Elbert K., M.D., F.R.S.N.A., F.I.C.S. (Radiology)**, Chicago, Illinois
Instructor in Radiology, Northwestern University Medical School; Radiologist, St. Bernard's Hospital.
"Accessory Bones and Anomalies often Mistaken for Fractures"

4:00- 4:30 **Lambert, Claude, N., M.D., M.S.**
Chicago, Illinois
Associate Professor of Orthopedic Surgery, University of Illinois College of Medicine; Attending Orthopedic Surgeon, St. Luke's Hospital.
"The Relationship of Occupational Strains to the 'Disc Syndrome'"

4:30- 5:00 **Burkholder, Theodore M., M.D., F.A.C.S.**, Chicago, Illinois
Attending Urologist, Illinois Central, Evangelical and Englewood Hospitals.
"Occupational Injuries to the Male Urethra"

Joint Meeting of Obstetrical and Gynecological Section with Urological Section

Wednesday Afternoon, September 12

Meeting Dedicated to Dr. Guy L. Hunner

Presiding: George H. Ewell, M.D., F.I.C.S., Madison, Wisconsin

P.M.

2:00- 2:15 **Guy L. Hunner, M.D., F.A.C.S.**
Baltimore, Maryland
"A Few Reminiscences of One Who Has Worked in Close Association with Gynecologists, Obstetricians, and Urologists for More than a Half-Century."

2:15- 2:30 **Howard W. Jones, Jr., M.D.**
Baltimore, Maryland
"Gynecological Aspects of Urology."

Symposium

"The Renal Factor in Pregnancy—Non-Toxemic Hypertension of Pregnancy."

2:30- 2:45 Gynecological Viewpoint: **Wynne Silbernagel, M. D.**, Columbus, Ohio

2:45- 3:00 Urological Viewpoint: **John W. Ferrin, M.D.**, Chicago, Illinois

3:00- 3:10 **Discussants:**
Edwin J. Decosta, M.D.
Chicago, Illinois
Walter J. Reich, M.D., F.A.C.S., F.I.C.S., Chicago, Illinois

3:10- 3:20 **General Discussion**

Symposium

"Stress Incontinence in the Female."

3:20- 3:35 Gynecological Approaches: **Charles B. Kelley M.D., F.A.C.S., F.I.C.S.** Jersey City, New Jersey

3:35- 3:50 Urological Approaches: **Herbert E. Landes, M.D., F.A.C.S.,** Chicago

3:50- 4:00 **Discussants:**

M. Leopold Brodney, M.D., F.A.C.S., F.I.C.S., Boston, Massachusetts
Alexander A. Levi, M.D., F.A.C.S., F.I.C.S., Boston, Massachusetts.

4:00- 4:10 **General Discussion**

Symposium

"Management of the Surgical Traumatized Ureter."

4:10- 4:25 Urological Factor: **Alfonso Davalos, M.D.,** New York City, New York

4:25- 4:40 Gynecological Factor: To be announced

4:40- 4:50 **Discussants:**

J. P. Greenhill, M.D., F.A.C.S., F.I.C.S., Chicago, Illinois
To be announced

4:50- 5:00 **General Discussion**

Announcement

International Board of Occupational Surgery

The Executive Council of the United States Chapter and the Board of Trustees of the International College of Surgeons have unanimously approved the formation of an International Board of Occupational Surgery, the aims of which are (*a*) elevation of standards for the practice of occupational surgery, (*b*) conservation of the health of the worker after occupational injury, (*c*) official recognition of this specialty, (*d*) stimulation of interest in this field by students and members of the profession, and (*e*) cooperation in the establishment of facilities for graduate education in occupational surgery by means of residencies in hospitals affiliated with medical schools, or their equivalents.

For further details, address Dr. Arnold S. Jackson, Secretary, United States Chapter, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10, Illinois.

SCIENTIFIC MOTION PICTURE PROGRAM

Philip Thorek, M.D., Chairman
Arkell M. Vaughn, M.D.
Jerome J. Moses, M.D.
Adolph M. Maller, M.D.

Monday, Tuesday, Wednesday and Thursday
September 10, 11, 12 and 13, 1951

The motion picture theater will be in continuous operation from 10 a.m. to 12 noon and 2 to 5 p.m., Monday through Thursday. Each film will be shown twice during this period as scheduled.

Monday, September 10 and Wednesday, September 12, 10 a.m.

Removal of Massive Osteoma of Skull with Tantalum Cranioplasty

Ralph M. Stuck, University of Colorado School of Medicine, Denver

This film represents the three operative procedures necessary to remove a massive osteoma of the vertex of the skull and the right supra-orbital portion of the skull. This tumor was known to have existed since 1934 and was removed in 1950. Roentgenograms of the skull taken 23 years ago are included in the picture. The details of the tantalum cranioplasty are also shown, as well as the postoperative photographs of the patient.
Silent: 30 minutes.

Monday and Wednesday, 10:30 a.m.

Goniotomy

Harold G. Scheie, University of Pennsylvania, Philadelphia

The rationale for goniotomy is depicted. The technique for performing the operation is outlined. The results obtained with the operation until 1949 are tabulated.
Silent: 8 minutes.

Monday and Wednesday, 10:38 a.m.

Surgical Management of Primary Hyperthyroidism

Frank H. Lahey, The Lahey Clinic, Boston

The method of raising the skin flaps, the preservation of the recurrent laryngeal nerve, the demonstration of the parathyroids preserved and the method of doing a radical subtotal thyroidectomy as employed in this clinic are demonstrated. The film also shows the method of exposure of the upper pole, the method of ligation of the inferior thyroid artery and the method of complete removal of all the isthmus from the trachea.
Sound: 23 minutes.

Monday and Wednesday, 11:01 a.m.

Thymectomy for Myasthenia Gravis

Alfred Goldman, Cedars of Lebanon Hospital, Los Angeles

This film depicts the history, operation, roentgenograms, therapeutics, pathology and result in thymic tumors associated with myasthenia gravis.

Monday and Wednesday, 11:25 a.m.

Pulmonary Stenosis: Surgical Treatment of a Congenital Heart Disease

Ralph Adams, University of Louisville, Kentucky

Demonstration of the physiological changes in a case of pulmonary stenosis with operative correction.
Silent: 24 minutes.

Monday and Wednesday, 11:49 a.m.

Hernia of the Lung

Lawrence M. Shefts, Baylor University College of Medicine, Texas

This film illustrates the diagnosis of pulmonary hernia, including roentgenographic findings. The repair as shown requires dissection and closure of the sac and utilization of periosteal flaps from the ribs above and below the defect.
Silent: 11 minutes.

Monday, September 10, and Wednesday, September 12, 2 p.m.

Complete Exenteration of the Pelvis

Alexander Brunschwig and Virginia K. Pierce, Cornell University Medical College, New York

Wide excision of the involved tissues as well as the surrounding structures are shown. The technic of bilateral implantation of the ureters is demonstrated. Postoperative views of a group of patients are shown.
Silent: 29 minutes.

Monday and Wednesday, 2:29 p.m.

Parotid Tumors

Raymond W. McNealy, Northwestern University Medical School, Chicago

The technic of surgical excision of tumors of the parotid is demonstrated. The surgical anatomy is depicted and postoperative results are shown.
Silent: 12 minutes.

Monday and Wednesday, 2:41 p.m.

Ulnar Nerve and Soft Tissue Defect and Simultaneous Repair in Forearm

Armed Forces Institute of Pathology, Washington, D. C.

This film demonstrates the method of repair of an involved ulnar nerve and a rather extensive soft tissue defect in the forearm. The use of a pedicle graft between the abdominal wall and the forearm is shown. Postoperative views are included showing the functional result and nerve regeneration.
Sound: 11 minutes.

Monday and Wednesday, 2:52 p.m.

Esophageal Diverticulectomy

Conrad J. Baumgartner, College of Medical Evangelists, Los Angeles

The excision of a large pharyngeal esophageal diverticulum in an 84-year-old man is shown. A two-stage procedure was carried out for the following reasons: (1) age of patient, (2) marked debility of the patient, (3) size of the sac with a wide neck, and (4) deep extension of sac into the mediastinum. A follow-up picture taken 6 months postoperatively shows marked gain in weight.
Silent: 21 minutes.

Monday and Wednesday, 3:13 p.m.

Transthoracic Resection for Carcinoma of Esophagus

R. Arnold Griswold, University of Louisville, Kentucky

History of a case of carcinoma of the esophagus with demonstration of the operative technic is shown.
Silent: 20 minutes.

Monday and Wednesday, 3:33 p.m.

Spontaneous Rupture of the Esophagus

S. Allen Mackler, Cook County Hospital, Chicago

The physiologic mechanism whereby rupture of the esophagus occurs is described. The historical aspect of the disease is noted. A case is presented, and the significant diagnostic findings are described. Preoperative radiographic films are shown. The thoracic approach to the rent in the esophagus is depicted. Gastric content is seen lying free in the pleural cavity and upon the intrathoracic viscera. The method of surgical repair, postoperative radiographic films, and the patient postoperatively are demonstrated.
Silent: 18 minutes.

Monday and Wednesday, 3:51 p.m.

Ureterosigmoid Anastomosis by Direct Elliptical Connection

Reed M. Nesbit, University of Michigan, Ann Arbor

Transplantation of the ureters into the sigmoid is demonstrated by means of a direct elliptical connection. A transverse incision is utilized. Colored illustrations and roentgenograms amplify the film.
Silent: 30 minutes.

Monday and Wednesday, 4:21 p.m.

Right Hemithyroidectomy for Cystic Adenoma

Bernard J. Ficarra, St. Peter's Hospital, Brooklyn

The technic of hemi-thyroidectomy for cystic adenoma involving the right lobe is shown. The surgical anatomy is emphasized.
Silent: 9 minutes.

Monday and Wednesday, 4:30 p.m.

Surgical Treatment of Carotid Body Sensitivity in Man

Armed Forces Institute of Pathology, Washington, D. C.

This film demonstrates the effects of pressure upon a sensitive carotid body. Bilateral removal of the carotid bodies is shown, including the nerve of Hering. Postoperative results are included.
Sound: 24 minutes.

Tuesday, September 11, and Thursday, September 13, 10 a.m.

Surgical Treatment for Congenital Pulmonary Stenosis

George H. Humphreys II, College of Physicians and Surgeons, New York City

After a brief description with diagrams of the anatomy and physiology of the condition, a 7-year-old child is shown who exhibits typical signs and symptoms of pulmonary stenosis. Heart sounds are recorded on the track; the roentgenogram and electrocardiogram are shown, as well as the cardiac catheterization tracings. The main steps in the procedure of pulmonary valvulotomy are demonstrated, with emphasis on the special instruments employed in the operation. Her improvement is shown, and comparative postoperative findings discussed.
Sound: 23 minutes.

Tuesday and Thursday, 10:23 a.m.

Ligation of the Vena Cava and Ovarian Vessels for Suppurative Pelvic Thrombophlebitis

Conrad Collins, Ochsner Clinic, New Orleans

This film demonstrates the ligation of the inferior vena cava associated with the bilateral ligation of the ovarian vessels for suppurative thrombophlebitis. In connection with the ligation of the vena cava lumbar sympathectomy is done also. Postoperative views of the patient are shown.
Silent: 19 minutes.

Tuesday and Thursday, 10:42 a.m.

Horseshoe Kidney: One-Stage Transperitoneal Bisection of Kidney Isthmus and Bilateral Nephropexy

Charles M. Stewart, University of Southern California College of Medicine, Los Angeles

The preoperative history, laboratory data and roentgen findings in a female patient suffering from a horseshoe kidney which has impaired drainage on both sides are shown. The surgical procedure is performed in one stage through a transverse abdominal incision, transperitoneally. The kidney isthmus is well demonstrated. After bisection of the isthmus a bilateral nephropexy was done. Postoperative pyelograms are shown, taken 5 weeks and at 5 months.
Silent: 21 minutes.

Tuesday and Thursday, 11:03 a.m.

One-Stage Suprapubic Prostatectomy with Primary Closure of the Bladder

George H. Ewell and Harold W. Bruskewitz, Jackson Clinic, Madison, Wisconsin

A discussion is presented of the various procedures which have been found to be extremely satisfactory in doing a one-stage suprapubic prostatectomy with primary closure of the bladder. Particular attention is called to the method of controlling bleeding.
Silent: 22 minutes.

Tuesday and Thursday, 11:25 a.m.

Total Abdominal Hysterectomy and Perineorrhaphy

Joe Vincent Meigs, Harvard Medical School, Boston

Total abdominal hysterectomy and perineorrhaphy are depicted. The surgical anatomy and relationship of the ureters are shown. Postoperative results of this reconstructive procedure are included.
Silent: 17 minutes.

Tuesday and Thursday, 11:42 a.m.

Abdominoperineal Resection for Carcinoma of Rectum

Richard B. Cattell, Lahey Clinic, Boston

This film shows the technic for removal of carcinoma of the rectosigmoid or rectum. Particular emphasis is paid to the pelvic dissection with isolation, ligation and excision of the lateral ligaments together with the major pelvic dissection done abdominally. Complete peritonealization of the pelvis is shown. The perineal part of the resection is brief requiring only division and excision of the levator ani and transverse perineal muscles. The perineal wound is closed except for a small Penrose drain.
Sound: 18 minutes.

Tuesday, September 11, and Thursday, September 13, 2 p.m.

Pyloromyotomy for Infantile Pyloric Stenosis

John L. Madden, St. Clare's Hospital, New York City

The physiologic effects of congenital hypertrophic pyloric stenosis are illustrated by animated diagram, as are the

general features of the Fredet-Weber-Ramstedt operation of pyloromyotomy. A typical case is shown; and the standard surgical procedure is followed, wherein the pyloric tumor is incised longitudinally down to the layer of mucous membrane, which is then free to herniate up through the incised musculature. The postoperative course in the patient shown was uneventful.
Sound: 14 minutes.

Tuesday and Thursday, 2:14 p.m.

The Technique of Cholecystectomy

Kenneth C. Sawyer, University of Colorado School of Medicine, Denver

This film portrays the steps of an uncomplicated cholecystectomy. The title explains the steps in the procedure.
Silent: 13 minutes.

Tuesday and Thursday, 2:27 p.m.

Cholangiojejunostomy with Partial Hepatectomy Following Biliary Obstruction

Philip Thorek, University of Illinois School of Medicine, Chicago

This procedure is applicable to those cases in which the common and/or hepatic ducts have been injured. A modification of the Longmire operation is presented in which two anastomoses are shown, one over a T-tube and one over a rubber catheter. Step-by-step illustrations of the procedure, roentgenographic studies and postoperative views of the patient are included.
Silent: 36 minutes.

Tuesday and Thursday, 3:03 p.m.

Excision Anal Fissure, Fistulectomy and Hemorrhoidectomy with Caudal Anesthesia

Neil Swinton and Urban Eversole, Lahey Clinic, Boston

The technic of excision of an anal fissure, fistulectomy and hemorrhoidectomy are demonstrated. Caudal anesthesia is used. The film is amplified with illustrations.
Silent: 23 minutes.

Tuesday and Thursday, 3:26 p.m.

Cyst of the Urachus

Norman O'Neill, University of Southern California School of Medicine, Los Angeles

This film demonstrates the removal of a large urachal cyst. Its dissection in the abdominal wall into which the cyst had become imbedded is carefully shown. The specimen and its contents are depicted.
Silent: 12 minutes.

Tuesday and Thursday, 3:38 p.m.

Surgical Approaches to the Knee Joint

LeRoy C. Abbott, San Francisco, California; Veterans Administration, Washington, D. C.

Animated diagrams show the anatomy of the anterior and posterior aspects of the knee joint. Operations employing approaches to the anterior and posterior aspects, and to the medial and lateral semilunar cartilages are shown. Each is recapitulated in animation.
Sound: 39 minutes.

Tuesday and Thursday, 4:17 p.m.

Splenorenal Anastomosis

Louis M. Rousselot, New York College of Medicine, New York

The anastomosis of the splenic vein to the renal vein for portal hypertension is demonstrated. Illustrations amplify the film. Physiology and anatomy involved are clearly described.
Sound: 19 minutes.

Tuesday and Thursday, 4:36 p.m.

Crushing Injuries of the Thorax: the Treatment of Hemopneumothorax by Temporary Closed Suction Drainage and Pulmonary Decortication

Howard K. Gray, Mayo Clinic, Rochester

Pulmonary decortication is carried out by means of the "cross-hatch" method of peel. The use of temporary closed suction drainage is depicted.
Silent: 18 minutes.

The Eighth International Assembly
of the
International College of Surgeons
will be held in Madrid, Spain
May 20-24, 1952

PREMIERE OF FILM FORUM

PHILIP THOREK, M. D., Chairman

Monday Evening, September 10, 1951

8 to 10 P.M.

Grand Ballroom, Palmer House

The premiere of THE FILM FORUM will be presented, in which four outstanding surgeons will exhibit their films. Each surgeon will comment on his film during its showing; this will be followed by a general discussion and question period.

Louis A. Buie, M.D., Mayo Clinic, Rochester—Moderator

8:00 p.m. to 8:30 p.m.

Harry E. Bacon, M.D., Temple University, Philadelphia
"The Technic of Abdominoperineal Proctosigmoidectomy Without Colostomy and With Preservation of the Sphincter Musculature"

8:30 p.m. to 9:00 p.m.

Lester R. Dragstedt, M.D., University of Chicago
"Supradiaphragmatic Gastric Vagotomy for Peptic Ulcer — The Abdominal Approach."

9:00 p.m. to 9:30 p.m.

Samuel F. Marshall, M.D., Lahey Clinic, Boston
"Gastric Resection for Postbulbar Ulcer"

9:30 p.m. to 10:00 p.m.

Willis J. Potts, M.D., Northwestern University, Chicago
"Surgical Division of Patent Ductus Arteriosus"

In Memoriam

CLIFFORD BELL LULL

M.D., F.A.C.S., F.I.C.S.

Dr. Clifford Bell Lull, prominent Philadelphia obstetrician and gynecologist, died on July 6 after a brief illness. He was 57 years old. In 1915 Dr. Lull was graduated from the Jefferson Medical College, where, from 1941 to 1946, he served as clinical professor of obstetrics. He had served his internship at the Jefferson Hospital. Dr. Lull was director of the division of obstetrics and gynecology at the Philadelphia Lying-In Hospital, chief of staff at the Delaware County Hospital and consultant in obstetrics and gynecology at the Philadelphia General Hospital. He was an associate examiner of the American Board of Obstetrics and Gynecology and a member of the editorial staff of The Digest of Treatment. The author of numerous medical articles and of two books on obstetrics ("Management of Obstetric Complications" and co-author of "Control of Pain in Childbirth"), Dr. Lull emphasized the importance of education of women to the need of adequate prenatal care, this care being a vital factor in the reduction of mortality in childbirth.

Dr. Lull was greatly honored by all who knew him, not only for his skill and wisdom in his profession but for the human qualities that so distinguished his career. In the various organized groups to which he belonged, he made his membership significant and memorable.

Dr. Lull was a member of the following medical and surgical societies: the American Medical Association, the Pennsylvania State Medical Society, the Philadelphia County Medical Society, the Philadelphia Obstetrical Society (past president), the Philadelphia College of Physicians, the American Gynecological and Obstetrical Travel Club, the Washington Gynecological Society, the American Association of Obstetric, Gynecologic and Abdominal Surgeons, the American College of Surgeons and the International College of Surgeons, serving effectively on the Qualifications Board of Surgery in obstetrics and gynecology. The officers and members of the International College of Surgeons extend their warmest sympathy to the bereaved.

RAYMOND JAMES MURPHY

M.D., F.I.C.S.

Recently Dr. Raymond James Murphy died in Chicago at the age of 53. Dr. Murphy took his academic training at the University of Chicago, received his medical degree cum laude from Loyola University and, from time to time, pursued postgraduate studies at the Cook County Hospital and the Cook County Postgraduate Medical School. He served his internship at the John B. Murphy Hospital. Dr. Murphy was at one time chairman of the staff of the John B. Murphy Hospital (now closed). He served as attending surgeon at the Columbus Memorial and Frank Cuneo Hospitals and on the Courtesy Staff of the Illinois Masonic Hospital. In 1932 Dr. Murphy taught operative surgery at Loyola University.

A fellow of the International College of Surgeons, Dr. Murphy was also a member of the American Medical Association, the Illinois State Medical Society and the Chicago Medical Society (North Shore branch).

FREDERICK KNOWLES

M.D., F.I.C.S.

Dr. Frederick Knowles of New York City died recently at the age of 76, after a long and fruitful career. Dr. Knowles received his preliminary education from public schools in New York City and from gymnasia in Vienna, Austria. His medical degree he received from the College of Physicians and Surgeons of Columbia University. Dr. Knowles served on the surgical staff of the Presbyterian Hospital and the New York Surgical Clinic and maintained courtesy privileges at St. Luke's Hospital, the Flower-Fifth Avenue Hospital and the Lenox Hill Hospital, all in New York City. During World War I, Dr. Knowles taught anatomy and surgery at the Chattanooga Medical College.

In addition to holding a fellowship in the International College of Surgeons, Dr. Knowles was a member of the American Medical Association, the New York County Medical Association and the Association of Military Surgeons.

HOME OF THE
INTERNATIONAL COLLEGE OF SURGEONS

and the

UNITED STATES CHAPTER

1516 - 1526 Lake Shore Drive

Chicago 10, Illinois

Assembly Information

HOTEL RESERVATIONS: Write to:
Housing Division,
The Chicago Convention Bureau, Inc.,
33 N. La Salle St., Chicago 2, Illinois.

REGISTRATION: Sunday 2:00 p.m. through Thursday, 3:00 p.m., September 9-13, Palmer House, Chicago.
Advance registration (on Sunday) will save your time.
Admission by badge only to all scientific Assemblies, section meetings, and to the exhibits. Present your I. C. of S. membership card to expedite registration. Registration fee, $5.00.
Bona fide doctors of medicine serving as residents and interns, if vouched for by written card or letter by the superintendent of their hospital or by an officer of the College, will be registered as guests. Please present credentials at Registration Desk.

BANQUET: Grand Ballroom, Palmer House, Wednesday, September 12. Tickets may be purchased at the Registration Desk.

CONVOCATION: Thursday evening, September 13, at the Civic Opera House. Tickets available at Registration Desk for members of the International College of Surgeons, all registrants, their families and guests **(no admission fee).**

MEMBERSHIP INFORMATION, MEDALLIONS and the JOURNAL of the International College of Surgeons at Booths 55 and 56, Exhibit Floor.

PRESS and International College of Surgeons' office (Exhibit Floor).

ASSEMBLY PROGRAM: Papers: Grand Ballroom, Palmer House

SECTION MEETINGS: Orthopedic; Plastic, Ophthalmology and Otorhinolaryngology; Urology; Obstetrics and Gynecology; Occupational Surgery. Please consult your program (obtainable at the Registration Desk).

SCIENTIFIC AND TECHNICAL EXHIBITS: Exhibit Floor.

MOTION PICTURES: Modern surgical techniques will be presented in the Scientific Exhibit Hall by Davis & Geck, Inc., Brooklyn, N. Y., in addition to the regular film program. The films will show continuously on Monday, Tuesday, Wednesday, Thursday, September 10-13, from 10:00 a.m. to 4:30 p.m.

SURGICAL FILM FORUM: Monday evening, September 10, in the Grand Ballroom, Palmer House.